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IN THE SUPREME COURT
OF THE UNITED STATES.
OCTOBER TERM, 1906.

THE STATE OF KANSAS, *Complainant.*
vs.
THE STATE OF COLORADO *et al.*,
Defendants.
THE UNITED STATES OF AMERICA,
Intervenor.

No. 3, Original.

REPLY BRIEF OF COMPLAINANT ON FINAL HEARING.

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SECTION 1. The Defendant's Errors.

For the high character, the learning and the professional ability of the counsel who have appeared for the state of Colorado and for the other defendants we have profound respect. But the brief filed on behalf of Colorado is packed so full of statements that are not only erroneous but are liable to be misleading, that it calls for a refutation, and such refutation is in nowise to be construed as an impeachment of the character or the learning of the eminent counsel for Colorado, nor of the individual counsel who himself prepared their brief now on file. The errors to be hereafter pointed out are due perhaps to ignorance of the real facts and not to lack of ability or attention. These errors run through the entire part of their brief devoted to the discussion of the facts of the case, and may all be charged to the lack of information and personal

acquaintance with the conditions in Kansas, and especially with the conditions in Kansas prior to the diversion of the waters of the Arkansas river in Colorado, and also to their lack of information as to the topography of the Arkansas valley below Garden City. It would seem that not one of the counsel for Colorado ever saw the Arkansas river or the Arkansas valley in Kansas prior to the depletion of the river by Colorado irrigators, and that the individual counsel who prepared the brief never spent an hour along the Arkansas river below the state line, unless it was in a Pullman car, and that in the night-time. They are forced to fight against what they may call a dream, for they never saw it, but what was to others a visible and useful reality for twenty-five consecutive years. In order to satisfy the demands of their state, counsel are called upon to deny or to palliate what they never saw, and to explain what they do not now understand. What was once a river is a river no longer, and because it does not now exist they try to believe it never existed, although they have the water in their possession, and its former bed is visible for 350 miles. The sand bed their irrigators have created and which counsel have ridiculed is all they can see, but the mold in which a river was cast remains where natural forces placed it before the hand of irrigation in Colorado became manifest. It is their misfortune never to have seen the Arkansas river as it originally flowed, and this misfortune has clouded their vision and darkened their brief, until they themselves cannot say where the water once went which they now capture and restrain. Clouds and darkness are round about them, and are found everywhere in this brief, affecting even the logic as well as the facts.

The same misfortune enshrouded the principal witness for Colorado in all his testimony concerning the conditions in Kansas. Professor Carpenter does not even pretend to have known anything about the Arkansas river, or the Arkansas valley in Kansas, prior to the year 1903, and never even saw

the river or valley prior to the diversion of water in Colorado. His observations and his acquaintance with the river and the valley even during the years 1903 and 1904 were confined to a few days' time, and even then his knowledge was second-hand and his information hearsay. He may know something of Colorado and its conditions, but as to Kansas he was afflicted with Sam. Weller's disease, a "limited wision."

Another misfortune has pursued the counsel for Colorado, and is the foundation of one continuous error as to the facts as stated in their brief, and this is the class of testimony introduced by the defendants as to the original flow of the river in the early days. The witnesses found and produced by the defendants on this point were almost exclusively travelers, gold-seekers, hunters, soldiers, who crossed the plains once in their early life, followed the Santa Fe trail once in the early days, saw the river once or on one trip and never again. Leaving their homes in the spring to cross the plains in the summer or fall, they saw the river at the dry season of the year, after the snows from the mountains had melted and the June rise had passed away, and when the rainfall was lightest. Counsel have given such evidence as this, confined to a day or a few days at most, and almost invariably in August and September, as great weight as the evidence of the witnesses who settled on and along the river in the early '70's, and have continued their residence ever since, seeing and using the river daily, crossing and recrossing it continually for thirty-five years or more, and seeing it before as well as after its depletion. These Kansas witnesses are a part of the settlement and development of this country, and, like the founder of an ancient nation, could say, "All of this we saw, and a part of this we were." Counsel for Colorado have counted the number they secured who could recollect that they had crossed the plains years ago, and placed their numbers and their limited recollections and their one day's observation against the numbers selected and used by Kansas who for a third of a

century have continuously seen what they described. They count their numbers of travelers against our numbers of settlers, and then cry "equality." They count these hunters and travelers across the plains, who saw the river during the late summer or fall once or three times, as against Caldwell, who, with the exception of the years he was in the army, has lived on the river continuously since 1850; with Mathewson, who has lived on the river continuously since 1853; with Wright, who has seen it constantly since 1859; with Mead, who has seen it constantly since 1863; with Murdock, Lawrence, McCanless, Rutledge, Harrison, Jurgensen, Hess, Tupper, Hansen, Shive, Campbell, Fullington, Wellman, Edwards, Diesem, and a hundred others, who have lived on the river continuously ever since the settlement, in the late '60's or early '70's. We submit that such numerical comparisons are misleading in the extreme, unfair, and highly unjust. A witness who saw a river on one day or during one week is not so competent a witness as to the average or the normal flow of the river through the whole year, or through a number of years, as the witness who saw it every day through the whole year for a quarter, or third, and some of them a half, of a century. In fact, as to the average or the normal flow of the river during these early years not one of these travelers was competent to testify, and did not testify as to this; and yet counsel count each of them as one in their numerical comparisons. This evidence does not even rise to the respectability of negative testimony. These witnesses produced by Colorado were not there to see, and do not pretend they were. Yet when a witness for Kansas testifies that he has seen the river daily for thirty-five years, and knows its average and normal flow during all these years, and then describes this flow, counsel have attempted to offset this testimony by that of a witness who saw the river once during the fall of one dry year. We protest against this kind of argument, and it can only tend to befog or mislead the court. These witnesses

have not in fact contradicted each other, and, with the exception of two witnesses introduced by Colorado, the evidence can all be harmonized. Of course, Mr. Lynch's statement that the river between 1881 and 1889 was dry at Oxford two-thirds or three-fourths of the time was simply untrue, and some parts of Professor Carpenter's testimony in regard to the lower part of the Arkansas valley is not according to the facts. But, outside of this, all the evidence introduced harmonizes with the evidence of Messrs. Mathewson, Mead, Caldwell, Edwards, Vincent, Bigger, Wright, Beeson, Diesem, and the others; for all the Kansas witnesses stated that in extremely dry years, for a few days in the fall, the river would be low or even sometimes dry; but they went on and described its condition at all other times of the year, which was what the Colorado travelers could not do and did not pretend to do. Counsel can make just as strong and just as logical an argument from Mr. Mathewson's testimony alone as they have from their own. Mr. Mathewson testified that in the fall of 1860 the river was dry through the western portion of Kansas. Counsel can make their whole argument as to the flow of the river from this statement alone. They can say that if there was no water in the river in the fall of 1860, during the trans-Mississippi drought, there never was any water in it at any time. But this is neither fact nor logic. They must take all Mr. Mathewson said, and must draw a general conclusion only from a general review of all his evidence. But here lies the error in the Colorado brief: general facts were ignored; particular facts, merely local and temporary, alone are stated; and then a general conclusion was drawn from a particular premise. This error will be more fully pointed out hereafter in this reply.

SECTION 2. Admissions and Omissions.

The State of Kansas in its bill of complaint, in its evidence and in its brief on final hearing, heretofore filed, alleged and proved nothing that was strange, unnatural, or extraordinary.

It alleged and proved natural conditions and argued natural results and inevitable conclusions. It was shown that the waters of an interstate stream had been taken out in the upper state for irrigation purposes, and that the natural and normal flow in the lower state had been to that extent diminished. It was further shown that the western part of Kansas is in the semihumid region, and that the use of these waters in Colorado had impaired the productiveness of the adjacent lands in Kansas; that the periods of low water had been greatly extended; that the periods of drought had been enormously increased, and that these diversions had thereby interfered with the prior vested rights of the state of Kansas and its citizens.

Neither is there anything strange, unnatural or extraordinary in the acts of the corporate defendants complained of in this case. The defendants have severally and collectively plead, admitted in evidence and admitted in argument that they so appropriate, divert and use the waters of the Arkansas river in Colorado for irrigation purposes, which waters so appropriated and used in Colorado would, following the law of gravity, flow on down through the Arkansas valley in Kansas.

Counsel nowhere deny that the decreed appropriations of the large Colorado ditches along the Arkansas river are as set out in our former brief on pages 124 and 125, and, according to the testimony of Mr. Chew, amount to 3997.31 cubic feet, and that 200,520 acres are actually irrigated, and that 318,504 can be irrigated (497). Mr. Wiley testified that the carrying capacity of the Amity ditches was something over 2000 cubic feet (1447). It is admitted by counsel that all these ditches take far more than their decreed appropriations when the water is not demanded by other ditches, and that during the growing season, except in time of flood, the ditches in Colorado take all the flow of the river, and then have not enough to supply their wants (503, 504).

The United States government has filed its petition of intervention in this action, and has taken its evidence, and filed its argument, showing that conditions similar to those along the Arkansas river exist along the other rivers and streams arising in Colorado and flowing through the lower states and territories, such as the South Platte, North Platte, Laramie, Sand creek, and the Rio Grande, and that conditions similar to those in Kansas exist in the lower states of Nebraska, Wyoming, New Mexico, and other states and territories. It was abundantly proven by the evidence of the intervenor that the waters of these rivers have been appropriated in Colorado for the purposes of irrigation, and that such diversion in the upper state has produced results in the lower state similar to those produced in the state of Kansas by the diversion of the Arkansas river. The facts shown by the intervenor to exist in these states and territories corroborate and support those shown by the complainant to exist in the state of Kansas.

There is, however, something strange, unnatural and extraordinary in the briefs filed in this case by counsel for defendants, both in what they omit, in what they admit, in what they pretend to state as facts, and in the conclusions they pretend to draw.

In the brief of the state of Colorado there is no reference to the fact that forty-eight witnesses were introduced on behalf of the intervenor, who testified to the effects produced upon the lands in the other lower states by the diversion of the waters of these interstate rivers within the upper state. The witnesses for the complainant described the effects of the diversion of the waters of the Arkansas river in Colorado upon the lands lying lower down the stream in Kansas, and the witnesses for the intervenor described exactly similar effects along the streams rising in the upper state and flowing through the other lower states having prior settlements. In the brief of the state of Colorado counsel attempt to deny or

minimize the effects in Kansas, while they omit all reference to similar effects in Nebraska, Wyoming, New Mexico, and other states and territories similarly located. In the brief for the state of Colorado all the evidence of the intervenor upon this point stands unnoticed and all the facts established by its witnesses stand unchallenged. While the intervenor's brief was not on file when the brief of Colorado was prepared, yet these facts and conditions in these other states had been sworn to and were of record, and the omission to make any reference to these existing facts in other states, while they attempt to deny similar conditions in Kansas, leaves the counsel for Colorado in the situation of admitting that four from four leaves nothing in Nebraska, Wyoming, and New Mexico, but at the same time asserting that along the Arkansas river in Kansas four from four leaves four still remaining. Till counsel for Colorado can "rail the seal from off" the oath of the intervenor's witnesses, they but offend their "lungs to speak so loud" concerning the conditions in Kansas. Water appropriated, diverted, used, absorbed, dissipated, is gone from the bed of the original stream wherever that stream is located and in whatever direction that stream flows. The omission to deny or refer to the conditions, results and effects on the northeast, the north, the west and the south renders ineffectual any attempt to deny similar natural conditions, results and effects in the other direction toward Kansas on the southeast. These omissions in regard to Nebraska, Wyoming and New Mexico make the attempted denials as to Kansas futile and unavailing.

In the briefs of the defendants it is expressly admitted, or there is a failure to deny, that the Arkansas river flows through the territory described in the complainant's brief, and that the settlements in Kansas were made as therein described, and prior to the appropriations of water complained of, and they admit that the defendants have appropriated and used the waters of the Arkansas river in Colorado

in the manner, at the times and places and in the amounts charged, and they admit or fail to deny that these appropriations are severally and collectively administered by and through the officers of the state of Colorado as further described in the complainant's bill; but defendants have entirely omitted to make any reference to the fact that prior settlements give prior rights, and the counsel for defendants treat these prior vested rights with disdain and implied contempt, as though they had no place in law and are not protected by constitutions, statutes, and judicial decisions. Their admissions and omissions are of such weight and importance that they will alone warrant a decree in favor of the complainant, in spite of some denials they have made and some objections they have interposed.

It is admitted that Kansas was settled first, its lands along the Arkansas river were entered and cultivated prior to the diversion of the waters of the river in Colorado, and that these subsequent diversions absorbed all the normal flow of the river during the growing and summer season of the year. With these admissions, and with no denial of these facts, little proof is needed to show that as a natural result the flow of the river has been impaired, the amount of its water in Kansas has been decreased; that the lands along its banks are less moist, as the level of the underflow is lowered; that these lands are less productive and less valuable; that material injury has been sustained in Kansas, and that for all these things the defendants are responsible. After all these admissions, it is futile for counsel for Colorado to quote detached sentences or paragraphs of descriptive history, to cite years of extreme drought and days of noted dryness, and attempt factious denials of natural and inevitable results. While fully admitting these subsequent and continued diversions of the total flow of the river in Colorado, it is absurd to claim that they could take so much from nothing, or assert with fine audacity that after they have taken it all the whole remains.

Counsel have not attempted to prove an *alibi* for the defendants; they admit they were there and that they have the captured goods in their possession; but after this admission they attempt to claim they took this much from nothing, and then plead that, as the original possessor recuperated fifteen years afterwards from other sources, they should be allowed to keep the goods and be permitted annually to repeat the depredation.

The strongest admissions and the most significant omissions on the part of the counsel for Colorado are in regard to the natural conditions both of topography and elevations along the Arkansas valley in Kansas, and especially between Garden City and Wichita. The facts set out in section 7 of our former brief are neither denied, explained, nor commented upon, and yet a knowledge of these natural conditions is indispensable to a correct understanding of the Arkansas river in Kansas, the cause of the diminished flow in recent years, the lowering of the underflow, and why the diversion of the water in Colorado has produced the results described. In the few days spent along the river in Kansas by Professors Newell, Mead and Johnston they did not learn the real topography and natural elevations of the country for 250 miles below Garden City. Professor Carpenter, knowing nothing whatever of this topography, in his observations, limited to a few days, and called by the defendants for some theory of defense, has been led into the most egregious errors, giving much testimony that is far from correct, and even absolutely false and misleading, and counsel for Colorado have simply followed Professor Carpenter, and so have arrived at false conclusions. They have not denied, but simply ignored, the topography and elevations along the river, and from false evidence have drawn false conclusions as to the flow of the river and its effect upon the underflow. If Professor Carpenter had understood the facts of topography and elevations from Garden City along both sides of the river to Oxford, Colorado's exhibits Nos. 24, 31 and 32 would never have been

made, and the argument of counsel concerning these diagrams and the flow of the river and the lowering of the underflow would never have been written. If counsel had understood these facts of topography and elevations, they could have given a true and reasonable explanation of the decreased flow of the river in recent years and its necessary effects. If counsel had understood these things, they would have seen that the rainfall upon the uplands finds its way into the Arkansas river many miles below the points along the river at which they assume it enters. They would have seen that all this rainfall, both upon the uplands and the Arkansas valley, except a very narrow strip adjoining the river itself, first flows into the tributaries that run almost parallel with the river, and does not flow into the river directly, as they assume, for to do so it must flow up-hill. From Garden City largely, and from Dodge City almost entirely, the seepage is away from the river and not toward it. Thus through all this distance the river feeds the underflow, and the underflow does not feed the river. This is not true to the same extent between Coolidge and Garden City that it is between Garden City and Dodge City, and especially between Dodge City and Wichita. Counsel have overlooked the fact that every mile of every tributary between Dodge City and Wichita, except Walnut creek, which rises and flows for a distance on the divide, is lower than the Arkansas river at a corresponding point, and that water in Kansas insists on running down-hill in spite of the testimony of Professor Carpenter and the argument of counsel for Colorado.

As to how and why the river has narrowed for 200 miles above Oxford or Arkansas City and the river-bed filled with islands, and as to why all this narrowing and filling have taken place, and these islands have grown over with trees, since the diversion of the waters in Colorado complained of, and as to why the river had never narrowed or begun to narrow or the islands never formed or begun to form prior to

that time, counsel for Colorado make no plausible explanation. The photographs stand undisputed and the measurements stand unimpeached. This omission in itself is forcibly significant. Since the prairie sod has been broken up the run-off is less from rains and the amount absorbed by the plowed ground is more, but the level of the underflow is lower. This fact is left both undisputed and also unexplained by opposing counsel. The present appearance of the river itself is left unaccounted for. The whole river from Arkansas City to Coolidge is changed. No such change has taken place along any of the other rivers of Kansas, and this sole and solitary change of the Arkansas river has taken place since the diversion of its waters in Colorado; and yet this change is passed by, overlooked, unexplained by counsel. Complainant's exhibit No. 1 was taken in the summer of 1878, and shows the river at its medium summer flow, while exhibit No. 41 was taken at the same place on the 16th day of September, 1904, showing the water two feet below the abutments of the bridge, and the bridge 300 feet shorter, and this changed condition extends many miles up the river. Exhibit No. 45 shows the condition of the river at Garden City from July 25, 1903, to May 3, 1904. At Kinsley the river has narrowed from a width of 1000 feet to 500 feet, and 500 feet that was once river is now pasture land, with trees thirty feet high. These photographs are unnoticed by counsel, and these conditions are without comment.

After making these admissions and omissions, the denials and extenuations attempted in defendant's briefs are so strange, unnatural, and extraordinary, so fictitious and contrary to the evidence, that we shall notice them in detail.

SECTION 3. Present Prosperity in Kansas.

Four briefs have been filed in this case on behalf of the defendants, but the brief on behalf of Colorado demands the most attention. It is shown by the record that the writer of that brief was not present at the taking of any of the testi-

mony, he neither saw nor heard any witness, he did not participate in the former argument before this court, and it is quite clear he must have prepared this brief for Colorado from an inconsiderate reading of marked passages of the printed record and from a second-hand examination of the exhibits. This has been more unfortunate to him and his clients than it is injurious to us. The facts in this case do not depend upon the shading of a sentence nor upon the emphasis of a particular word given in oral testimony, and what counsel has admitted and omitted is a refutation of his argument, and the body of the testimony shows his conclusions to be unfounded and untrue. When Colorado takes the water and keeps it, Kansas loses it.

Professor Carpenter's testimony, which is at least voluminous, dates back only two years, and he did not pretend to be acquainted with any conditions in the state of Kansas prior to the year 1903, and all his observations have been limited to a few weeks' casual and isolated visits, based upon a few measurements largely made by others, and within the same limited period, and his Kansas maps, diagrams and figures are drawn, made and collected to show conditions about which he had no real information, and even about portions of the state he had never visited. The map introduced by Professor Carpenter as Colorado's exhibit No. 23 was first published in the Twenty-first Annual Report of the Director of the United States Geological Survey for the year 1901, and this map was prepared by Professor Johnson, who first visited the Arkansas valley in 1896, fully ten years after the diversions in Colorado had begun their work of devastation, and simply shows the conditions which these diversions had wrought, and did not even pretend to show the conditions as they formerly existed. The brief of Colorado is fairly luxuriant with these misconceptions of conditions and misstatements of facts; with these *non sequiturs* and these drawings of general conclusions from particular premises. It is argued in this brief that be-

cause there has been unprecedented prosperity throughout the country for the last few years, therefore portions of Kansas have not been injured by Colorado at any time during the last twenty years; it is argued that because there has been water in the Arkansas river during the wet years of 1904 and 1905, therefore, there has always been water in the Arkansas river during the growing season of the year; and at the same time it is argued that because the water is lower in the fall than in the spring of the year, and because during the periods of extreme and protracted drought a few times in the early years the river has in places been dry, therefore, there was never any real Arkansas river and its flow could not be diminished or injured; and with this kind of logic it is argued that the Arkansas valley has never been injured in past years because there is something growing there to-day. According to this part of the Colorado brief, it is a defense to an action for damages for the defendant to show that the complainant has something left, and that no such complainant can recover unless he is bankrupt or living within the confines of an almshouse. According to this part of this brief, present selling price of land is determined by or exactly indicates the precise productiveness of the same land years ago unaffected by subsequent general economic conditions. According to this brief, there is an exquisite and exact correspondence between the selling price of land at one time and its productiveness at other times, and that productiveness, alone always and everywhere, determines the price. If, however, counsel had been well informed of the facts of this case, the past and the present conditions in Kansas, its natural history and its natural development, and of the changes wrought in the Arkansas valley within the last twenty years, and of the lack of similar changes in the other river valleys in the state; if he could have looked at the facts of this case from the standpoint of the witnesses who testified, and the residents who settled the valley in Kansas; if he could have taken a near valley view instead

of a distant mountain glance; if he could have had a view extending over the last thirty-five years instead of a glimpse subsequent only to May 3, 1904; if he had considered the experience and the evidence of half-century residents instead of picking out selected parts of a transient traveler's evidence who saw the river once during an extreme and unnatural drought and a limited period and then was gone forever; if he had taken the testimony as it is and read it in connection with the natural laws of the universe, this part of the brief would have been different from what it is. If counsel had used their knowledge of the daily market reports, they would have known that the present prosperity of the whole country extends to Kansas as well, and that this is in spite of the continued injuries inflicted on portions of the territory of Kansas during the last twenty years. If they had not overlooked the fact that the assessed value of Prowers county, Colorado, alone, in the year 1900, according to their own showing, as set out on page 13 of our former brief, was almost equal to the combined assessments of Hamilton, Kearny, Finney, Gray and Ford counties in Kansas for the year 1904, this argument could not have been what they made it. The later assessment of these five Kansas counties makes this disparity greater and more pronounced. Their total assessment for the year 1905 was $6,035,392, as against the assessment of Prowers county of $5,271,930, as shown by Colorado's exhibit No. 22. Something beside general prosperity for the last two years must be called in to explain this disparity of values. The residents and witnesses who live in Kansas and who are familiar with the facts would fail to recognize the picture drawn by counsel for Colorado in this case, and can only observe that professional ingenuity has been exercised to the utmost.

Counsel speak of the "radiant panorama of prosperity," but failed to note many things appearing in the record, and in fact failed to note the whole drift and tenor of the evidence. They failed to notice that the testimony was taken between

the 15th day of August, 1904, and the 16th day of June, 1905. They failed to notice that the year 1904 subsequent to May 3 was the wettest year in the history of the state, when both amount of water and distribution are considered, and that this excessive humidity had continued in 1905 through the period of taking testimony. They failed to note that the whole country is now passing through a period of great and extensive prosperity, and that Kansas is only receiving its fair share, but the testimony which they quote on pages 9 to 33 limit this general advance in prices of lands to the last few years and since this action has been commenced, and they failed to note that the advance of bottom lands of the Arkansas valley had been confined almost entirely to the months since January, 1905, as testified to by the county clerk of Finney county (1868), and whose assessment tables, set out on page 1862, show no advance at all for the year 1903, and that in 1904 there had been "no particular change in the valuations, sir." (1865.) That there has been a gradual increase in lands and property values throughout the Arkansas valley as the country has been developed, public lands exhausted, railroads constructed, and improvements bettered, is not only true but natural, and not because of the diversion of the Arkansas river in Colorado but in spite of it, as testified again and again by the witnesses.

Mr. B. H. Campbell, of Wichita, says:

"Lands are more valuable now than in the early years, but they certainly produced more then than they do now. The cultivation in the early days was not as good as now. We have improved in means of cultivation a good deal; we have better implements and more intelligent and educated farming during these last years. Land is higher in price now because of the general prosperity of the country, the general advancement in values, facilities for transportation, the scarcity of the public domain, which is becoming exhausted and lands becoming scarce, the demand increasing and the supply decreasing. All that had contributed to the enhancement of farm lands. The proximity of markets to these lands is a part of the growth of the country and the railroad

facilities for carrying products. The proximity of the market has been very noticeable. We have had good markets and we have had good railroad facilities that carry our products to the markets for consumption. These markets and railroad facilities are all about us, all up and down the valley, all over the country. In later years they have increased very much. Cities near here are points of consumption to some extent. We consume quite a good deal here with our factories and packing-houses and other institutions. That applies more to the vegetable market than anything else, because the excess always goes away and that makes the market. It is facilities for carrying it away that have really brought the increased value of lands—and the markets. The price of lands has not been enhanced by the fact that the river has gone dry; the reverse is true; it depreciated the value of the land *per se*. The less productive the less value, of course." (336, 337.)

Mr. Rutledge, of Colwich, says:

"The thing that kept up the value of my land when there was a continuous, protracted falling-off in the crop yield was the demand for land. Land has increased in Illinois and all the Western states. There has been nothing done to rob Illinois of its natural advantages." (304.)

Mr. Breese, of Wichita, says:

"Q. Please state if you can how much more valuable it would be provided you had the underflow under the land similar to what it was in 1878.

"A. At least one-third more.

"Since 1890 the fertility of the soil is one-third less than what it was about 1878. This is caused by lack of moisture. We have been rotating in crops and have been trying to farm good. Corn in this country matures about September. It now not only requires a sufficient amount of rainfall to make a corn crop, but the rainfall should be properly distributed throughout the growing season. Corn in this valley has been only occasionally injured by too much rain. The farmers in the Arkansas valley have not only been injured from want of moisture for their crops, but also in lack of water for their stock and domestic purposes. This lack of moisture and the lowering of the underflow have damaged the crops to a great extent." (298.)

Mr. Harrison, of Colwich, says:

"The value of lands throughout this whole country has increased in spite of the taking of the water from the river and not because of it. The advance in the value of lands in

Sedgwick county is supposed to be the cause of the scarcity of lands, the general prosperity of the government, the building up of the state, the introduction of railroads, and the general development of the country. The taking of this water has been detrimental to the farmers along the river, regardless of the general crops throughout the country in general. The certainty of our crops on the bottom lands depended upon the presence of this underflow." (279.)

Mr. G. W. Shive, of Burrton, says:

"When I stated that I was satisfied with my land, I would be better satisfied with it if the underflow was restored as it was when I knew it first. It would be more profitable and valuable to me." (302.)

Mr. Lawrence, of Wichita, says:

"The land is not as valuable as it would be if the underflow was as it was during the first fifteen years that I knew this county. One reason why land has risen here during the last few years is on account of better improvements; another is that the markets are better and nearer. We have good shipping facilities, packing-houses, manufactories, mills, and railroads, and the increase of population has taken away our products. This rise in the price of land has been in spite of its productiveness, for it certinly is not as productive as it was fifteen years ago, and is not as valuable, considering productiveness alone." (332.)

Mr. Caldwell, of Hutchinson, says:

"The productiveness of the land in the valley has been affected concerning corn crops. The change has been detrimental. It has been detrimental to vegetables raised in the valley." (362, 363.)

Mr. Hess, of Arkansas City, says:

"These mills that were originally located as water-power mills have now an auxiliary steam power that they use on account of the insufficiency of the water in the canal." (414.)

Mr. Baxter, of Kinsley, says:

"The only reason I can see for the falling-off in the acreage of alfalfa between those two years is because it has not been a profitable crop between that time and this. The crop increased from 1896 to 1898. In 1898 it was more than 6000 acres, if I remember right, but from that time to this it has steadily decreased every year so far. I have the other books for the years intervening." (440.)

Mr. Vernon, of Larned, says:

"I attribute this comparative change in the relative values now to the fact that the continued productiveness of the bottom lands had been disappointing and the productiveness of the uplands had been greater than was anticipated, and to the fact that the uplands are much better for wheat." (443.)

Mr. Swartz, of Sterling, says:

"Yes, sir, this is a broom-corn country, and most of it used to be raised along the river. As to whether my lands would be more productive and more valuable if the underflow were now as it used to be, I would say, why, I think it would. Yes, sir, it would be better broom-corn land also as well as corn land." (2079.)

Mr. Overley, of Oxford, says:

"As to what interest I have in this suit, and as to whether I have any feeling or any desire that this case should be decided either for the complainant, The State of Kansas, or for the defendant, The State of Colorado, well, I think that where a fellow is injured, I think he is against it, of course. As to whether I think I have been injured as a result of something that has been done by the state of Colorado or by the people of the state of Colorado, well, we have been injured every year since they have taken that water away." (2214.)

Mr. Doughitt, of Oxford, says:

"As to the rate of increase in the value of bottom lands in the last few years, I will say it is not as high as it was. There are lots of us on the river lost our crop last year, and, as I tell you, we have n't been raising as good crops as before; but there is not so much demand for the bottom land now right in the neighborhood as there was formerly. As to whether the bottom lands are not worth now more than they were four or five years ago, I will say, yes, sir, they are. Taking them all together, they are worth more than they ever were before in the history of the country; yes, sir, because the improvements on them are bound to make them worth more if the land is not worth more (2238, 2239). Yes, sir, I object to taking water out of the river above for irrigation if they take it out during the dry season. That is what I answered counsel. Yes, sir, I think taking it out during the dry season is an injury to me. If they should let the water flow as it normally flowed during the dry season, but should take the flood waters and put them in reservoirs and then use the flood waters for their irrigation during the dry season, that would serve their purpose and not injure me. Yes, sir, that is what

I mean. No, sir, I consider it would be a benefit to me for them to take the water during the flood season of the year. As to the productiveness of my land being as great as it was when the river was larger during the dry season of the year, and when the underflow was nearer the surface of the land, I will answer, it is not as good." (2240, 2241.)

DEFENDANT'S WITNESSES WHO LIVE IN KANSAS.

These quotations from the testimony of complainant's witnesses who live in Kansas might be largely extended, but the same facts are also testified to by the defendant's witnesses who also live in Kansas; and as counsel have laid some stress upon the fact that they introduced witnesses from this state, and have quoted some detached sentences, we shall quote more extensively from their testimony, showing that even the witnesses for the defendant admit every fact claimed by us for the complainant.

Mr. Larmor, of Garden City, says:

"It sub-irrigates when the river comes up. Yes, the crop of those earlier years was dependent upon this sub-irrigation along the river valley. It depends all the time, almost, on that. Yes, the sub-irrigation was lower during these intermediate years than it was during 1884 and 1885, because we did n't have so much water in the river. It spreads underneath the ground. Yes, this sub-irrigation depends upon the water in the river. . . . Yes, last year a flood came down here the very first of May, and then one a little later in May, and one in June, and then one that caused the Eden wreck in Colorado, and then another that caused the washout of the Santa Fe railroad up on the Purgatoire river. Yes, that kept up a constant and high flow of water during the year. There was a good flow, but still according to my information there was not as much as in some other years, but I may be mistaken. Yes, those floods during 1904 kept up the flow in the river, and that kept up the sub-irrigation under my land, and when that is kept up I have good crops on my bottom lands. When the flow of the river ceases the sub-irrigation under my land falls and my crops necessarily dry up. That is correct (1463). Yes, the underflow affects the bottom lands along the river, and it rises and falls with the condition of the river. I have observed that time and again. There can be no doubt about that, because my bottom is dry. I will keep watching back. I will keep watching at the back end to see how son the water will get back there from underneath,

and I know the balance of my crop is all right then. If the flow of water in the river is good the underflow under my land is kept up and I get a good crop. If there is no water in the river we don't have any underflow. I remember one year was very dry. The 3d day of July my bottom hay in places would be burned, right in the river bottom, because there was no water in the river and had n't been that spring. That evening of the 3d the river came up and got full banks, and in one week the grass was green and it looked as if it growed a foot in one week. It had n't, probably, but it straightened up and seemed to grow that much. I have seen the underflow go back 1100 feet in less than twenty-four hours, to my knowledge, but it will not do that all over the bottom, because it seems there are certain places it will go faster than in others, depending on what is underneath." (1465.)

Mr. Stocks, of Garden City, says:

"As to the last ten years, there has been a shortage of water at times during the summer months—always during the winter and fall months. As to the diversions in Colorado having interfered with the success of the Garden City ditches, I will say something has prevented our getting water in the fall and winter. I don't know what the cause is. It may have been taken out in Colorado. Yes, sir, if the evidence in this case shows that Colorado has appropriated three or four times the normal flow of the water and actually diverted it from about 1887 to 1890, I would say that the diversion of practically all of the water flowing in the river through the eastern portion of Colorado has affected our Garden City ditches and the success of them (1486). Examining complainant's exhibit A-45, I think I recognize it. It seems to be a photograph of the river bridge and a section of the river to the west of the bridge just south of Garden City. As to that being a correct picture of the river and its condition from August, 1903, down to the 1st day of May, 1904, I cannot to a definite certainty fix the exact dates, but it shows practically the condition from some time late in the summer, perhaps August or September, 1903, up until practically the 1st of May, 1904. It was some time early in May, or about the 1st of May, when the first flood water came down, in 1904." (1491.)

Mr. Hill, of Garden City, says:

"I think that the normal flow of the river from 1890 to 1900 was less than the normal flow of the river from 1880 to 1890. Yes, the year 1904 was a very wet year, and a great deal of rain, and a great deal of water in the river coming down when there was no water in Kansas, yes, sir. . . . Yes, I think the dry periods are longer now, during the last ten years, than

they were during the first ten years that I observed the river. It seems that they begin earlier in the spring and last longer in the fall. Yes, I remember such a thing as a June rise in those earlier years. The river would come up and stay up quite a while. During the last ten years I would n't state about that. I have not observed it closely enough. But I don't think the June rises last as long in these later years as they did in the earlier years. As a general average during the last ten or fifteen years, the June rise does not come as high nor last as long as in the first years. In the last years when there is a rise they come more suddenly and go more suddenly." (1498.)

Mr. Crane, of Dodge City, says:

"Dodge City is a larger town now than it was ten years ago, and a better town, and more money, and better buildings, and more business (1503). I think that the crops are better cultivated through this county now and for the last three or five years than they were the first three or five years after I came here. I presume they have better machinery, better barns, are better prepared to take care of their crops and better prepared to cultivate their crops than in the earlier years." (1504.)

Mr. Evans, of Dodge City, says:

"Yes, the river looked to me as though it had more water in it for the last two years than before, and I mean by the two years 1904 and 1905. Yes, sir, 1904 was a very wet year. I believe there was a good deal more water came down the river from heavy snows and rainfalls in the state of Colorado and New Mexico during the year 1904. Yes, there were a number of very heavy rains in those days that kept the river flowing a good share of the year 1904. Yes, sir, and I said that condition in 1904 was about the condition of the river as I knew it down to about 1880. Yes, sir, and I said that the river fell off after that and became very much drier than in the earlier years. I think it is a known fact that for the last fifteen years prior to the year 1904 there was not so much water in the river as there was during the earlier years as I knew it. That is my recollection (1507, 1508). Yes, sir, I have heard of the June rise. They were generally here about the 1st of June. I don't believe it varies much from that. As to the origin of that June rise, I think it was snow in the mountains. I always supposed it was. No, those June rises did n't altogether come from local rainfalls. We always had that whether we had rains here or not. I have seen some of them come two or three feet at a time. As a general thing, though, they were more gradual than though they had

come from a freshet by a rain-storm here. Those June rises would last about a month, I guess. A month would be a fair average. And sometimes they would last six weeks. Oh, yes, we have had them every year during the last twelve years. I could n't say that they come to as great an extent as they did in the earlier years." (1508.)

Mr. Argabright, of Dodge City, says:

"Yes, there were a number of periods of high water in the river in this county in 1904. I presume that our bottom lands are more productive when the river is in the condition it was in during the greater portion of the year 1904 than during a year when the river is very low. Yes, I think it would be for the benefit of the bottom lands of Ford county to have a greater supply of water than we had in the river for the last ten years prior to 1904. The lands would be more productive and more valuable. . . . (1520.) We began in 1888. We did n't have an apprehension of a failure of the water in the river to supply that ditch. It was our idea that there would be water enough in the river to supply it. I don't remember how the flow of the river was in 1891. We abandoned the ditch and did n't pay any more attention to it, and I did n't have anything to impress it upon my memory as to any particular year after that. We abandoned that ditch simply because we could n't get water in it in those years I spoke of, because the river went dry, and those who took stock in it or were members of the cooperative association lost interest and failed to keep up their assessments. They lost interest in it because we could n't get water in the ditch because the river was dry. This was in 1889." (1521.)

Mr. Juneau, of Dodge City, says:

"Yes, sir, I spoke of the failure of crops here in this county in 1904 having been caused by the drought in the winter of 1903-'04. During the fall of 1903, the winter of 1903-'04, and the spring of 1904 down to the 1st of May, why, there was not much water, but the river was not any lower than it was the year previous. In 1902 and 1903, it was about the same general thing so far as the river was concerned. Yes, the river came up the first wek in May, 1904, and remained up the balance of the year. Yes, sir, there was an unusual number of heavy rains in the state of Colorado and New Mexico throughout the whole summer of 1904, so that we had a number of periods of high water in the year 1904. Yes, the river is high now, and this is the second flood we are having now. Yes, sir, this high water in the river now shows in the well just in front of my lumber office where this testimony is taken, and the water is about one and a half feet higher now

than when the river is low. Yes, sir, the water rises in my well here 700 or 800 feet from the river when the water in the river rises, and it falls very soon after the water in the river falls." (1538, 1539.)

Mr. Lee, of Larned, says:

"Well, there is n't as much water running in the Pawnee now as in former years. Years ago, when I first knew anything about it, it did n't go dry. I never knew it to go dry. But since about 1893, I think, during part of the summer it would stop running and we would have to drive our cattle to another pasture or put in windmills to pump water for them. . . . Oh, yes, we have got better machinery to work with. As to the land values being higher, the state is also developing, of course, and the land keeps an upward tendency with the development of the country, yes, sir. (1548, 1549.)

Mr. Payne, of Larned, says:

"Yes, sir, the water-level on my land down below town here rises and falls with the condition of the river to some extent. When the river is up the water-level will be higher than when the river is down; but I have n't had an open well so as to particularly notice it. Yes, sir, I think the water-level under these first bottom lands back to the foot-hills rises and falls to some extent with the condition of the water in the river. . . . Yes, sir, there is better farming in this country now than there was thirty years ago, and the country has greatly developed within the last twenty-five years, and our town has developed and the whole state has developed greatly within that period." (1553, 1554.)

Mr. Schnack, of Larned, says:

"I can see lots of trees growing along there now, and I have seen them grow up for the last five or six years and maybe longer, and perhaps back as far as ten years. There was n't any at all the first few years, because I went along the river trying to get some cottonwoods to set out and could n't find any trees, only one here close to Larned; and I know, therefore, there was none there. . . . I think there is better farming here in the county now than there was thirty years ago. We have more and better machinery, and we have better farmers. . . . I don't think I saw many trees there in the '70's. But they began along about the '90's, I believe. I saw trees there then, but not sooner." (1557.)

Mr. Frizell, of Larned, says:

"Yes, there are probably better markets here now and better railroad facilities, and there has been a general development for twenty years. The conditions are a little more favorable. . . . As to how many trees were along the river within ten miles of Larned when I came here, I will say there was not one, and there are several hundred acres now. I would say that the timber began to grow most noticeable about twenty years ago and has increased very rapidly since. Yes, there are islands in the river within ten miles of Larned in either direction. As to the number of islands, I might say there are less. The channel on one side or the other in some cases has filled up and attached that island to the mainland, and has become what we call accretion or made land. That has been going on to a certain extent through the county, yes, sir. I could n't answer as to how many acres have been added to the amount of land along the river-banks. I would suppose that possibly there may be, in Pawnee county, of lands that have been taken in or added, possibly a thousand acres. No, sir, the river-banks are not as wide as they used to be. Yes, it is practically true all the way through the county that the river-banks have narrowed. I think the channel of the river is as deep as it ever was, but not as wide. It is true in many places that where there was an island in the early years now there is no island, because there is but one stream there and the island is attached to the made land, and the island and the made land are now grown up to trees. Yes, that is generally true through the whole county, and that is true in different places between here and Garfield. No, the river-bed is not as wide as when I came here. I would say that the river is not in as good and perfect condition to carry flood waters now as in those earlier years, because there is less river to carry the water. If the same amount of water in cubic feet should go down now, as to whether it would do more damage through the county than in the earlier years, I would say the same amount of water would do a greater damage now than twenty-five years ago." (1560, 1561, 1562.)

Mrs. Emma Leasure, of Larned, says:

"As to the way I judged of the water-level, being simply that the drive-well driven into the underflow and because we could n't pump that dry, I will say that it the only way we could tell anything about it." (1569.)

Mr. Brinkman, of Larned, says:

"As to the river-bed being as wide as it used to be, I will say, no, sir, it is not as wide. I don't think the river-bed is

as wide. I am satisfied it is not. . . . As to the level of the underflow rising after the river has been up and falling after the river goes down, my opinion is that it does rise and fall with the level of the water in the river. As to whether that is an admitted fact by every one here, I don't know, but I think that that is the opinion, so far as I ever heard an opinion expressed." (1573, 1574.)

Mr. Thorp, of Larned, says:

"The river-banks are not as wide as they used to be, and there is a good deal of made land along the river on each side, and it sometimes extends quite a ways down into the original channel of the river-bed, and that land has now become covered with trees. Yes, sir, there are a great many more islands in the river channel now than there used to be in the early days—scores of them where there were not any thirty years ago. These islands have become covered with trees and brush. Last fall I was at work on the bridge at Garfield. There was 400 or 500 feet of made land on the southeast side of the Garfield bridge, and you can't see more than half a mile either way from that bridge for the islands, because the view is obstructed by the trees and the brush. Yes, it is true that between Larned and Garfield the whole bottom of the river valley looks like a forest to-day. . . . As to the value of land being greater, I suppose it is caused by the immigration coming West and this craze for land. There are better improvements in our county than twenty years ago. This county has always been pretty well improved. Fences and houses and barns are improving all the time. Yes, there has been a general improvement all over the state. Yes, there seems to be a craze at the present time for land. This has lasted two or three years and is getting worse all the time. No, there was not very much of a craze for land here in 1903. Yes, there is considerable speculation in land here just at this time. It has lasted for a couple of years, I guess. It began, I think, in 1903; that is, real-estate men began to boom it. . . . When they dug the railroad well they dug that, and we can see the running water. That was about fifty feet across when they dug it. It is right here by the depot. It must be three-quarters of a mile, or maybe half a mile, from the river, straight down. Yes, sir, you could see the water running across northeast, about the same direction as the channel of the river. Yes, sir, it was so noticeable that it caused comment. All the people of the county went there to look at it in those days. Oh, yes, they would throw chips in and see them float right across off northeast. Yes, they would do that, and I saw them do it." (1577, 1578, 1579.)

Mr. Moses, of Great Bend, says:

"Right here opposite Great Bend I think the banks have narrowed possibly 200 feet. The original river-bed right at that point was at one time over half a mile wide. I don't remember any flood lately being as great as they used to be in the early days. We used to call those floods June rises, and it was understood that it was caused from the melting of the snows in Colorado. They came along in June. Sometimes it would last a couple or three weeks and sometimes less and sometimes more. . . . Land values have gone up here lately on account of the big crops of wheat. Ten years ago Barton county was not considered one of the half-dozen great wheat counties of Kansas, and to-day it is. During the last eight years it has been coming right to the front, and wheat is now our principal crop. Some years we raise very good corn, but it is not a sure crop. No, sir, we cannot rely upon a corn crop at all like we do upon our wheat crop." (1584.)

Mr. Gibson, of Great Bend, says:

"Yes, sir, I think the level of the underflow corresponds down where I live with the level of the water in the river. I think it runs right along, too, very nearly to the level, but as the underflow gets back—now, the river, it would be like it is now, and when it gets up it takes at a long time to get back in. It is slower than a fellow would think. It goes down very gradually and rises very gradually. It does n't crowd back fast. . . . Yes, sir, I know the land that Mr. Norris owns down there. A good share of his land is pretty low. He has one quarter, and I don't know but pretty nearly a section. No, you can make hay on most of it, except where there is too much brush, and there is brush over it along in places—mostly willows and cottonwoods. . . . That bridge was 900 feet, and we shortened it up 400 feet." (1591, 1592.)

Mr. Bidleman, of Great Bend, says:

"The wheat in Barton county is raised on this upland almost exclusively now. Of course, on the north side of the river we raise wheat mostly, but take those three townships on the south side of the river, they raise considerable corn, too." (1595.)

Mr. Williams, of Great Bend, says, as to conditions in general:

"No, sir, I have not noticed it." (1598.)

Mr. Rogers, of Great Bend, says:

"As to the underflow and as to what I mean by that, I will say, why, that is the water that comes up from the river and flows back under the ground. As to whether the underflow is higher or nearer the surface of the ground when the river is full than when it is low, I would say, yes, sir, in some places three or four feet. Well, from one to four feet it will rise up in some points; that is, in the meadow. It comes up a good deal on the surface in the low places. As to whether the underflow comes up near the surface of my land when the river is high, and remains high for a number of days, I will say, why, yes, of course, it must come up. When the river falls or becomes dry, then those ponds go dry. As to what furnishes these ponds with water, I will answer, what furnishes it is when the river is high we get this underflow current that fills in the ponds. No, sir, the ponds are not filled from the surface flow over the land." (1599.)

Mr. Epperson, of Great Bend, says:

"The farthest part of my land is a mile back from the river. I think the underflow does rise and fall at the farthest part of my land correspondingly with the river, yes, sir. Well, as to the river affecting the level of the underflow at least a mile back from the river, I would say I think so. While I have never had any occasion to dig at the north side, so that I would n't know anything about it, anybody that lives out there that has a cellar can tell you it affects it whenever the rain comes up. Yes, sir, that is a matter of just common knowledge in that neighborhood. Everybody knows it, yes, sir, unless it is a man that has n't a cellar; he might not know anything about this. During a wet season when the underflow is nearest to the surface the underflow has been within two feet of the top, and during a protracted drought the underflow is ordinarily about six feet. The variation of the underflow is about four feet, to the best of my knowledge and belief on the question. Yes, sir, from my experience that is about where I would place it. And this follows the river, coming up after a rise in the river and going down after a fall in the river. Yes, sir, I would judge so. That is my observation. Yes, sir, my land is good land. I have been offered fifty dollars an acre for it. If the underflow should go down below the lowest point it had ever been at and stay there, as to whether my land would be as valuable as it is now, well, my opinion is that it would n't. I don't think it would be as productive. If the underflow all along the valley should go down to the lowest point it was ever known to be at and remain there, as to whether the first-bottom lands would be as valuable and productive as they are now, I will answer that I do not think so. I think that the productiveness of the lands

along the Arkansas river does depend upon the presence of that underflow, to a certain extent, you understand." (1601, 1602.)

Mr. Lewis, of Great Bend, says:

"As to the underflow along the river here affecting the productiveness of the bottom lands, I will answer, the first-bottom lands it unquestionably does affect in some crops; for certain crops, most certainly. Those crops are alfalfa, corn, and potatoes, and all vegetables, yes, sir. Barton county is now going almost entirely into wheat raising. Yes, sir, the underflow does rise and fall with the condition of the river. As to the bottom lands being as productive if the underflow was very low and remained that way as they would be if the underflow was higher, I will answer, not so productive for alfalfa, wheat, or corn. I mean corn or potatoes; I don't mean wheat. . . . As to the underflow extending east from Kinsley to any extent, I will say, yes, sir, I think the underflow goes to Wichita. My chief evidence is, the Ninnescah comes out of the ground in Pratt county and is a stream from the Arkansas river. The river rises and falls with the rise and fall of the Arkansas river; that is, the Ninnescah. At Saratoga they once had a little mill there that could always run industriously when the Arkansas river was up, but when it was down it could n't. . . . As to that being generally known and acted upon through Pratt and Kingman counties, that the Ninnescah gets its source from the underflow, to a certain extent rising and falling with the rise and fall of the Arkansas river, I will answer, yes, sir, that is a fact. . . . Yes, we could go under the bridge when it was first built, anywhere under the bridge here at Great Bend. We could drive under it. Yes, sir, we did drive under it. They have driven their wagons under it. I drove my buggy under the bridge here at Great Bend. I don't know that I did anywhere else, but I did here. I drove under, sitting in the buggy. . . . If there were no water in the river to-day, no, sir, you could n't drive under the bridge there between as many bents of the bridge as you could when the bridge was built. Yes, sir, I think probably there are three bents we could drive under now, and my recollection is that when the bridge was built we could drive under all of them. You could n't drive under the others now if there was no water in the river, on account of the accumulation of sand and an island there. I think there are nine bents in that Great Bend bridge, but I would n't be positive. But I am under the impression that there are nine." (1605, 1606, 1612, 1613, 1616.)

Mr. Tyler, of Great Bend, says:

"Barton county has been raising wheat to such an extent

that it is very satisfactory and very productive, yes, sir, and wheat is the principal crop." (1609.)

Mr. Wilson, of Great Bend, says:

"Yes, sir, the underflow rises and falls with the condition of the river, so that when the river is up the underflow is up, and when the river is down the underflow is down." (1611.)

Mr. Swarens, of Hutchinson, says:

"As to the underflow not being higher at one time of the year than another, I will say, well, now, I can't say that I know. No, sir, between 1874 or 1875 and 1900 I have no means of knowing the condition of the underflow under my land." (1619.)

Mr. Welchons, of Hutchinson, says:

"Yes, I think you can see a great many islands in the old channel of the river as you cross the river on the Missouri Pacific railroad bridge going from here to Wichita." (1623.)

Mr. Hadley, of Hutchinson, says:

"The bridge first built was about 600 feet longer than it is now, I think. Yes, I presume the banks along the river have narrowed in proportion to the shortening of that bridge all along, yes, sir. As to a good many islands having grown up in the channel of the river, I will say, yes, sir, trees and grass have gotten started. There were some islands in it when we came to this country thirty years ago, but there were not nearly so many as there are now, and they were smaller. . . . As to land values, we have better markets here than we had in earlier years, yes, sir, and better railroad facilities, which have continued for eight or ten years. Yes, sir, the markets and railroad facilities and general development of the whole country of course are probably the reasons, or a large part of the reason—the principal part—for the rise in land values. Yes, sir, the town is in a prosperous condition, and our salt industry here has helped it and has added to the value of the lands near Hutchinson. Those things of course have had their effect, and I take into consideration all of these things when I speak of the value of land rising within the last few years or doubling within the last ten years." (1627, 1629, 1630.)

Mr. Foster, of Hutchinson, says:

"As to why it varies, well, I suppose—we count here that when the river is up the water is higher, because we have an underflow here from the banks on the other side of the river to the sand-hills, and I live in between the banks of the river

and those sand-hills; so that the underflow is beneath my land, yes, sir. . . . I think the first bridge here at Hutchinson was 1680 feet long. I could n't tell you how long it is now. . . . Yes, sir, the general farming is better than it was thirty years ago. As to whether that produces better crops, I could n't say. I suppose so. Yes, lands are more valuable than they were thirty years ago. We have more railroads and better markets and better facilities for marketing our products, and we have generally developed our county within that time." (1632, 1634.)

Mr. Jewell, of Hutchinson, says:

"Yes, during dry years the productiveness of our first-bottom lands depends, to a large extent at least, upon the condition of the river, and that is because of our sub-irrigation. During a dry year if the flow of the river is good the sub-irrigation furnishes the same moisture for our crops, yes, sir; but I don't know as it furnishes enough to make a crop. The productiveness of our soil in a year when there is not sufficient rainfall to mature a crop depends upon the sub-irrigation, except what little rain we get. Of course, we have to depend on the sub-irrigation. Yes, sir, the higher the sub-irrigation is in a dry year the more moisture we get and the better crops we have as a result. . . . Yes, sir, I spoke of the lands being higher. Oh, yes, there are better improvements on the land now in Reno county than there were thirty years ago, and better markets, and then the land rises because it is scarcer. In judging of the price of land I would take all of these things into consideration, and men do so in general, yes, sir." (1638, 1639.)

Mr. Culberson, of Hutchinson, says:

"When I came here there were sand-bars, we called them; now they have grown up in timber and grass. I could n't say how much of the original channel is covered by these islands now. They are just small islands, and some big ones, and little streams running in between them. Yes, sir, there are places along there that they call made land, but I suppose if the land is filled in the river is not as large as it used to be." (1642.)

Mr. Sprankle, of Wichita, says:

"I presume Ackerman's island was a mere sand-bar thirty years ago and could only be seen during low water. As to land being higher, yes, sir, there are better improvements all over the county than there were thirty years ago. Wichita is larger and has better markets, and the country here has generally developed in all directions during the last twenty-five years." (1646.)

Mr. Stevens, of Wichita, says:

"As to whether my land is more productive with the underflow near the surface than though the underflow was low, I will say I can't answer that; I don't know. As to whether the underflow influenced the productiveness of my lands during a dry year from lack of rainfall, I will say, probably it did. There would be more moisture. . . . It overflows more by my place than it used to. Yes, sir, I judge of the fact of it being higher water now by the fact that it overflows my place worse than it used to. Certainly the water gets higher in the river now than formerly. No, the river is not as wide at my place as it used to be. . . . As to the banks having narrowed up along my place since I first knew them, I will say, east of me I think it has narrowed about one-half, that is, on the south side, and the north bank has remained about as it was in 1877. West of that the north bank has filled in and the south bank has remained the same. Yes, sir, I know Mr. Harrison. His place is about two miles from mine. One of those places that I have just referred to where the river is filled in is east of him, yes, sir. He lives just above me. . . . As to land values being higher now, I will say there is a whole lot of difference, and there is a difference in the markets and facilities for transportation and everything of that kind. There is some better farming in this county now than there was thirty years ago. As to how the carrying capacity of the river at my place, with water in each instance at the same height, up to the top of the banks, compared now with its carrying capacity thirty years ago, I will answer, I stated that the river did n't have a capacity to carry off the water now that it once had at my place, and I thought that caused the overflow. If the same amount of water in bulk should come down the river now that did thirty years ago, I guess it would do more damage now than in the early years, yes, sir." (1648, 1649, 1650.)

Mr. J. R. Brown, of Colwich, says:

"Yes, sir, the land has all advanced in price, and there are better improvements, better markets, better facilities for marketing, and everything of that kind is now better than in the '70's, surely. . . . Yes, the river has filled in up along the land that I used to own north of Colwich. There is an island out there and there was a little channel running between the land and the island. The little channel closed up and that little island has been taken into a cow pasture since and has growed up to timber." (1661, 1663.)

Mr. Schaefer, of Sedgwick, says:

"It may be that when I found the river dry at Cimarron

crossing it was in September, 1860; 1860 was the dryest year I ever saw in Kansas, I believe. Yes, I think it is correct that it is so known in the history of that state and territory that 1860 was the dryest time ever known, and I believe that drought lasted longer than any other drought in its history. Yes, when I was up at Fort Zarah, from 1867 to 1869, I sometimes found plenty of water in the river. The June rise is what we calculated on to bring in the water, and we prepared for it, because at that time I had quite a lot of hay up. As to what I mean by the June rise, I suppose it was caused by the melting of the snows in the mountains, because we always expected a June rise; that is, high water, in the month of June from the outpouring of the watershed there in the mountains. This rise may have been a little later sometimes. It would depend upon the snow in the mountains as to when that melted, because this highest water I ever saw prior to my moving down here was in 1854. That was along in the month of July and part of August. Those rises would last anywhere from a week to two or three weeks. I could n't tell exactly. If you had been in the mountains you would have seen those torrents, and you know how they come. They come with a rush and go away with a rush. We would have a wall of water four or five feet high that would come down, and in a day or so you could go to the same place and find that water was gone. No, sir, it is not according to my understanding that these rises were caused by rains from the west. And they were not caused by rains in Kansas, I think." (1685, 1686.)

Mr. Dofflemyre, of Wichita, says:

"In coming to town I generally drive in with a buggy, and now am crossing the river on Douglas avenue, from the fact that the bridge on Thirteenth street is out of repair. The river has been all out over the bottom on the east side along by Thirteenth street and it is in very bad shape. Yes, I crossed the old wooden bridge on Douglas avenue and have a distinct recollection of it, and I have been crossing the iron bridge ever since it was built. Yes, sir, I remember Ackerman's island, in the river down here. As to its getting larger in later years, I will say it has gotten larger, yes, sir. I crossed the iron bridge this morning. I think there is a little point of Ackerman's island that extends a little below the bridge, maybe. I think that is true. Yes, I think Ackerman's island extends twenty-five to thirty feet below the south side of the Douglas avenue bridge to-day. Yes, there have been quite a good many trees on Ackerman's island, and some of them have been chopped off below the bridge. Right near the bridge on the north side they were cut down about a year ago. The trees on Ackerman's island run from small trees the size

of your arm up to perhaps five or six inches in diameter. Perhaps some of them are larger than that; I don't know. As to how long these trees have been growing there, I should judge fifteen or sixteen years perhaps in the neighborhood of that. I could not say exactly. Yes, I can remember when there was practically no island there, or when it was a very small affair, anyhow. Examining exhibit A-1, I will say, yes, sir, I recognize that as the old wooden bridge at Douglas avenue. Yes, sir, that picture shows what there was of Ackerman's island at that time, I guess. Yes, sir, that is a good picture of the river as it was from the time I knew it first down to 1879. Yes, sir, that old wooden bridge was taken down in 1879 and the iron bridge built in the same location. Yes, I recognize exhibit A-2, and I can see Ackerman's island, or the beginning of it, there. That picture represents it tolerably fairly. It was a sand-bar then and it would be entirely covered when the river would be high. Examining exhibit A-3, I will say it does n't show Ackerman's island. Yes, when that picture was taken Ackerman's island was below the water. Yes, sir, Ackerman's island has all grown up within the last fifteen or twenty years, so far as the island is concerned, and at low water at that time it appeared simply as a sand-bar. Yes, sir, I think so. . . . If the flowing capacity of the river has continually decreased, as to whether when the flood does come it will not do more damage than in the earlier years, I should answer, well, I should say it would. It would overflow worse. Yes, we are troubled at the present time with the overflow of waters. If the same amount of water should now come down that would come down thirty years ago, as to whether that would overflow a great deal more land than it did then, I would answer, yes, I suppose it would." (1693, 1694, 1697.)

Mr. Hall, of Sedgwick, says:

"Yes, sir, we are affected by droughts here, and we are affected by floods. Yes, sir, the less drought and the less flood we have here the better for the farmers. Yes, sir, if this suit should result in decreasing both the drought and the floods it would be better for the farmers of Sedgwick county. Our crops would be better on the average, I think, and would be better every year. Yes, we would be more certain of crops if the droughty season could be reduced. If the carrying capacity of the river has decreased I think we would be more subject to floods. Yes, if the result of this suit should be to keep a sufficient flow in the river and to keep the river channel washed out, and to impound the flood waters in the state of Colorado so as to decrease the floods, I think it would be very beneficial." (1705, 1706.)

Mr. Williams, of Wichita, says:

"Yes, sir, my land extends five miles along the river and a mile and three-quarters, at the farthest, back from the river. . . . The worst flood we have had was, I believe, eight years ago this coming July. That flood came from Colorado, I suppose. It did n't come from local rains; that is, around us. We had no local rains at that time." (1708, 1711.)

Mr. Winters, of Wichita, says:

"Yes, sir, when the river comes up to exactly the same point in height that it did thirty years ago, the water-level will be just as high on my land as it was then. That is what I meant to say, and that is the exact fact. And when the river is down it will go down just as low as it did thirty years ago; yes, sir, I know the water-level is lower when the river is dry than when the river is full. There is always dampness when you strike that quicksand. If you go down deep enough you always get water. I spoke about land being more valuable now; everything is more valuable in this county now than it was thirty years ago, yes, sir. Prices are higher. There are better improvements all through the county; larger cities, better markets, and better facilities to do business here. That is all true." (1740.)

Mr. J. W. Sites, of Wichita, says: ....

"The low land I spoke of occupies perhaps 250 or 300 acres. Yes, sir, the big slough runs diagonally through it. At my place it is about three-quarters of a mile wide, but it don't all run on my land; it extends over onto the other side." (1742.)

Mr. Lemasters, of Oxford, says:

"Yes, sir, I have known of skiffs going up and down the river. In the early days I used to ride in skiffs up and down the Arkansas river. I have not had any lately there." (1769.)

Mr. Phillips, of Mulvane, says:

"Yes, I think in general my soil is too far from the level of the water to be influenced by it. So whether the water went up or down two or three feet under my land, I don't think it would affect the crop. If it was near enough so that the roots of the crop would reach it, I presume it would affect it somewhat, especially in very dry times. I think there is such land as that along the river. Yes, sir, if the roots reached the water it might affect it if the underflow was a couple of feet down. If in one condition of the river the level of the underflow was three feet from the surface, I think that would

be better for corn than though the river changed so that the level of the underflow was five or six feet from the surface. I never have farmed that kind of land." (1781.)

Mr. Nixon, of Oxford, says:

"Yes, sir, I have heard of the underflow. I have heard them talk about the underflow that ran through there. As to how far back I understand it extends, why, they claim it used to extend clean back to that creek that runs through along the hill there. That is about three miles from the river. Yes, I think the crops are sometimes good and sometimes poor, and that is true on the bottom lands. If there was a year when there was not sufficient rainfall to mature a crop on these first-bottom lands but the river was full, as to whether they would raise a better crop than with the same amount of rainfall and the river being low, I don't know about that, hardly. It might be that the underflow would supplement the moisture. I never farmed there on the low bottom to know. My experience is confined to second-bottom lands entirely. I don't think we get any underflow on the second bottoms; at least, I never saw that it helped my crops any when it was dry. I would n't say that the underflow does not help crops on the first bottoms that are near enough for it to furnish moisture. If there was not rain enough to mature a crop, and the underflow did get near enough to the surface to furnish moisture, I suppose it would help it, yes, sir." (1782, 1783.)

Mr. Hahn, of Oxford, says:

"I have heard of Colorado taking the water out for irrigation. I have heard it talked among the farmers and papers and one thing and another. I have heard them say they were taking the water out up there and using it for irrigation. In places the water under the first-bottom lands that I have been farming is a couple of feet and in places four or five feet deep. It is not level exactly. I expect it would average five feet to water; that is, it would average from two to seven feet. Yes, sir, it is deeper to water on my land at one time of the year than at another. As to when it is deepest to water, I will say, whenever the river rises the water rises, and it falls with that. Yes, the water-level under the second-bottom land rises and falls with the rise and fall of the river." (1798.)

We have now quoted from the testimony of every witness introduced by Colorado who is referred to on pages 29 and 30 in the defendant's brief. It is readily seen that the facts they testify to are exactly the same as the facts testified to by their

neighbors introduced by the complainant, and if they have expressed a different opinion it is because their new-made lands along the river-banks have been flooded and damaged during the periods of high water in 1904 and 1905. The bottom lands in general have been injured by the low water in the river and the lowering of the water-level, and then by the filling up of the river channel and the narrowing of the banks were again injured by floods, and these facts have been described by the witnesses introduced by the defendants as well as by the witnesses for the complainant. These injuries, these losses, stand unimpeached, described, testified to, regardless of the fact that the years 1904 and 1905 were wet years; regardless of the facts of better improvements, better machinery, better farming, better markets, better facilities, less public lands to be had, and a period of notorious general prosperity. It would be strange, unnatural and extraordinary if all the water should be taken out above and leave it unaffected below. If witnesses should so testify their credibility would be questioned, and when counsel attempt to argue to that effect, they display intellectual desperation, and reveal a hopeless case. If water is so valuable in Colorado, why should it not be equally valuable in Kansas? Water is so inanimately responsive that it refuses to appear below after being used, absorbed and dissipated above. We need not repeat or requote any of the testimony set out in section 16 of our first brief on final hearing. Counsel's argument is weak against us because the facts are strong against them. The sun's rays as registered in complainant's exhibits 1, 2, 3, 41 and 45 cannot be distorted into reflecting an untruth even though counsel should forget to mention them and coldly pass them by. Fifteen or twenty years of drought from lack of flowing water cannot be obliterated by the hopeful rhetoric of counsel, although a wave of general prosperity has brought plenty and higher land values over large portions of the country, and two recent wet years have tended to restore some of the former moisture in the Arkansas valley. In a case of larceny it is

no defense that the injured party may have something left, and may even afterwards make money from other resources. As against the argument of counsel upon the point of prosperity in Kansas stands the fact in nature that land without water is not so productive as the same land with sufficient moisture. The defendants admit that they divert the waters of the Arkansas river in Colorado, and, regardless of an argument apparently ingenious, this diversion produces its natural effects on the lands below.

Under another subdivision of this point counsel for Colorado attempt to base an argument upon the crop reports of the state of Kansas, and exhibit some diagrams constructed by Professor Carpenter. If the agricultural reports of Kansas show what counsel claim they show, if they furnish any foundation whatever for their claims or conclusions, the fact that the defendants did not call Mr. Coburn, secretary of the Board of Agriculture, to the stand to testify concerning them, to tell how they are made and what they show, is certainly suspicious. Professor Carpenter, of Colorado, gives his interpretation of these reports on pages 688, 689, 690 and 691 of the record, and introduced Colorado's exhibits 27, 28 and 29 in evidence. Professor Carpenter, of Colorado, says:

"These facts would seem to show that whatever causes the fluctuation in the yield of crops in the Arkansas valley has had the same effect on the yield in the Smoky Hill valley and in the Solomon valley. Three diagrams and a map, marked defendant Colorado's exhibit 29, are prepared from the same agricultural reports of the state of Kansas, in the same manner, for groups of counties in the valleys of the Arkansas, Smoky Hill and Solomon rivers, and show the same general facts as to the corn crop in those valleys. The diagrams on the same group of counties show remarkable similarity. If one goes up, indicating a large crop, so does the corresponding line for the other river valley; and if the crop goes down in one valley it also goes down in the other valleys. They are so remarkably similar that it would make very little difference which one of the diagrams representing the yield was taken—that is, the diagram representing the yield in the Smoky Hill valley is almost identical with that in the Arkansas valley. It makes very little difference so far as the character is concerned. In the graphic map, defendant Colo-

rado's exhibit 28, and also exhibit 29, if the line goes up it indicates an increase in production; if it goes down it indicates a decrease. And as I was describing the diagrams, I spoke then of the lines going up or going down. Those expressions would be synonymous with the increase or decrease of the yield per acre." (691.)

Again and again Professor Carpenter, of Colorado, says these maps, these lines and these figures show the yield of crops in the Smoky Hill "valley," in the Solomon "valley," and in the Arkansas "valley," and that his lines going up or down show "the increase or decrease of the yield per acre." The fact is they show nothing of the kind. These agricultural reports were not prepared to show the yield of any particular acre, or set of acres, and do not distinguish between the yield on the bottom lands and upon the uplands. They do not show the amount of bottom land compared with the upland. They do not show how wide the Smoky Hill "valley" is, nor the Solomon "valley," nor the Arkansas "valley," the latter being influenced by the flow of the Arkansas river while the two former are not influenced by the Smoky Hill and Solomon rivers. Along the Arkansas river there is an underflow throughout the valley affecting the crops in a dry season, while along the Smoky Hill and Solomon rivers there is no underflow and no sub-irrigation. Mr. F. D. Coburn is perhaps the most skilful expert on facts of agriculture west of the Mississippi river. He has prepared the agricultural reports for about twenty years, and is well acquainted with every county and section of the state. On page 39 counsel quote one statement of Mr. Coburn's testimony taken on behalf of the state of Kansas. Mr. Coburn further says:

"As to whether I can make my last answer any more definite or certain or give any more information concerning the point than I disclosed in my answer, I will say, in view of its probable ambiguity, I wish to withdraw that answer and say, instead, that our statistics would not and do not indicate whether there is an increase or decrease in any crop on the bottom lands as distinguished from others. The smallest subdivision for which we compile statistics of crop acreages and yields is a municipal township, which may be of large or

small area, and the varying character of its lands or soils, the areas of each kind and the crops they produce of each kind, are not computed otherwise than collectively. The same system is pursued with reference to every portion of the state, township, county, and state as a whole." (2269.)

The reports themselves do not show, and do not pretend to show, whether the bottom lands along the Smoky Hill, the Solomon or the Arkansas river are more or less productive in recent years as compared with the early years. Whether these diagrams themselves correctly follow the reports we have not examined, but the reports themselves do not show what Professor Carpenter, of Colorado, testified to. On the contrary, the facts are just the opposite to what Professor Carpenter testified. That the bottom lands in the Arkansas valley are less productive than formerly, because of the loss of the water of the Arkansas river, has been testified to by scores of witnesses who live there and cultivate those lands. This testimony having been heretofore quoted by us need not be repeated. The bottom lands along the Saline, Smoky Hill and Solomon rivers are small and the valleys narrow, and these lands are as productive in recent years as they ever were.

Mr. Veale, of Topeka, says:

"As to whether there has been any decrease in the flow of the water in the Kansas river, taking it year in and year out, since I first became acquainted with the stream, I will say, no, I don't think there has. I think, if any change, there has been an increase, possibly. As to whether there has been any narrowing of the bed of the stream since I first became acquainted with it, I will say, no, sir, I think not. As to the flow in the other streams I have mentioned, as to whether there has been any decrease in the flow of water in those streams since I first became acquainted with them, I will say, no, sir, there has n't been any decrease. I am satisfied of that. The streams have been higher of late years.

"As to the productiveness of the soil in the bottom lands of the Kansas valley and its tributaries at the present time, as compared with what it was in the early '70's, well, we raise just as good crops now as we ever raised. Not every year, however, but the productiveness of the soil is equal now to what it was then, where it has been kept intact and treated properly.

"As to when I first became acquainted with these valleys, I began to farm in 1871; I became a settler ten years previous to that; but my farming experience on that bottom farm has been about the same all the time. It varies some as farming does everywhere. In some years I got better crops than in others, but I still raised good wheat and good corn, and I think the land is as good and worth as much per acre. As to whether I can produce as much corn and wheat per acre on those bottom lands as in the early years, I will say, oh, yes, I can do that. We do. That is done, yes, sir. We find no diminution, except as it may vary between the different seasons. Not on account of the soil. The soil is all right. If the statistics taken during a long period of years should show a gradual falling-off over the state in the yield of corn and wheat and oats per acre, as to what I would attribute it to, I would answer, to the putting of the thinner and poorer lands under cultivation. When we first came, of course we seized upon the best lands of the country, and they are the bottom lands altogether, and then we went onto the upper lands, and as we did that we took the second bottom, and so on until we got the worst. And now pretty nearly everything is under cultivation. There is a settler on nearly every quarter, and that brings into cultivation the poorer lands, and the floods wash them and the lands get thin, so that it brings down the general average of the crop." (2247, 2248.)

Mr. Wilson, of Hays City, says:

"As to the width of the bottom lands of the Smoky Hill river through Ellis county and in that vicinity, I will say, the bottom lands are practically insignificant; that is, what we call the bottom lands—the land first above the river-bed. There are small bends and some places of course where the bluffs come down to the river. As to the average width of the Smoky Hill bottom lands through Ellis county, I would think half a mile would cover the bottom lands, and as we go west they narrow, and as you go east they widen some. As to the Saline river, that is about the same, not much different. The bottom lands of the Saline narrow as you go west and widen as you go east, and they would probably be about the same through Ellis and Russell counties. They get wider in Lincoln, and in Saline county they widen out very much. Yes, sir, the Smoky Hill and the Saline are the principal rivers in the neighborhood of Ellis county. . . . As to whether the fertility of the soil in the valleys of the Smoky Hill and Saline and their tributaries in Ellis county is as great now as it was when the cultivation of the soil first began, I will say, yes, sir, so far as I know, that is my opinion; and I know from crops that are being raised there by the different people that the soil produces just as well now as it

did then. There don't seem to be any difference. As to whether just as large a crop of corn or wheat can be raised upon bottom lands of these rivers as when they were first cultivated, I will say, yes, sir, just as good. If the statistics should show that there has been a great deal of falling-off in the yield of wheat and corn in the state, as to what I attribute it to, I would attribute it to the cultivation of the poorer lands. I would n't know what else to attribute it to." (2255, 2256, 2257.)

Mr. Dawson, of Topeka, says:

"As to the flow of these rivers, and especially the Smoky Hill, Solomon, and Saline, for the last number of years as compared with the flow during the earlier years, I will answer, I think there is no material variation. There is no material variation in the width of these rivers as to their banks. No, sir, the channels of these rivers have not been filled up with islands.

"As to what lands through all of that country were taken up, entered, settled and cultivated first, I will answer, the valley lands. As to which is more productive, the valley lands or uplands, I will say the valley lands. After the valley lands were taken up, then the best of the uplands were taken up and cultivated; and after those the rougher lands; and after those then they moved on out west. As to the productiveness of those bottom lands, as to having changed, in all the years I have known them, I will say there is no material falling-off in the crops in that part of the state." (2263.)

Mr. Anderson, of Salina, says:

"As to whether the flow of the Smoky Hill, the Solomon and the Saline rivers has decreased or increased in the later years in comparison with the average flow in the earlier years, I will say, I think in both the Saline and Smoky there has been an increase in the flow in the last fifteen or twenty years. . . . As to how the productiveness of the bottom lands in Saline county for the last number of years compares with the productiveness of the same lands in earlier years, I do not see any diminution in the yields of either wheat or corn. With the same climatic conditions and the same quality of farming land, I think the bottom lands in Saline county are just as productive now and have been for the last ten years as they were in the earlier years. I think that is true. The bottom lands in Saline and the adjoining counties were settled first; then after the bottom lands were settled the second bottom lands were taken up; they were the next best land. And after these were all occupied, the best portions of the uplands. There is some very good upland and some that is very poor. And after those portions were taken up there

was none left to take, and what was left was the poorest quality of the land, yes, sir." (2269, 2270.)

Mr. Campbell, of Salina, says:

"As to being acquainted with the flow of the water in the streams in my neighborhood, well, I was pretty active out of doors all the time. I ought to be. I refer to the Saline and Smoky Hill generally. That is where I have been living since 1858, and part of the time I was on the other streams, back and forth occasionally. I would camp on them. Yes, I have been acquainted with the flow of the water in those streams, and particularly the Smoky Hill and Saline, ever since I went to Salina. Ever since I have been right on the river and have noticed them. . . . Oh, yes, I think there is considerably more water flowing in those streams now than in the earlier years. . . . Yes, sir, I think you can raise as good corn in these bottoms now as in the earlier years. . . . I first saw the Arkansas river in 1859, just across from the old crossing of the Walnut. No, sir, I did n't see the river during 1860 or 1861. I did n't see it during those dry years. I was not over there in those dry years. I was over there in one dry year. I went over to get my wife, on the Santa Fe road, and they had beautiful corn there and we had n't any. . . . Yes, sir, I spoke of going to the Arkansas river for my wife and seeing the corn growing there. The corn was growing there only in the Arkansas valley. On the hills there was n't any. I had to go over the sand-hills to get to this place, and this place was a point on the line of the Santa Fe road. The road is just one town west of it now. Yes, sir, I did go over to the Arkansas valley at that time, and there was no corn growing that we could see until we got into the Arkansas valley, no, sir. As to how the corn was looking at that time, oh, it was beautiful. We were perfectly astonished. I ought to remember the year in which that was. It was the year Mr. Hyde died. Whether it was 1881 or 1882 I could n't remember." (2275, 2277, 2279, 2280, 2281.)

Mr. Anderson, of Topeka, says:

"The Beaver and the Prairie Dog are tributaries of the Republican. I have been acquainted with those streams ever since 1880 and have observed the flow of the water in them from year to year. As to the flow of the water in those streams during the last ten years as compared with the first ten years, I will say the flow has been just the same—more regular; that is, they have been perhaps not as—well, more regular, I would say. I can't say that the flow is any greater but it is more regular. The streams are not dry as great a number of times as prior to that. No, sir, not from my observation has there been any falling-off in the mean annual flow

of the waters of those streams. The country when I first settled there was settled very limited. The first settlers came there in 1879. At the present time there are about 7000 people in the county. As to the capacity of the soil for raising crops on the bottom lands in my county as compared with the early settlements of the county, say in the '80's, I will say it is just the same. I don't see but what the bottom lands produce just as well now as they did in the early settlement." (2281.)

Mr. Mitchell, of Beloit, says:

"As to what part of our county was settled first, I will say the bottom lands. They thought that they were the best. On the average, I think they are more productive than the uplands. As to how the productiveness of those bottom lands in the later years would compare with the productiveness of the same lands in the earlier years under similar conditions, I think they produce just as much as they ever did. If the agricultural reports show in Mitchell county and in other counties adjoining that are similarly situated that as to certain crops there is a falling-off in the average yield per acre, as to how I explain that, I will say, the better lands were taken up first, and then they had to go onto the uplands, and onto the table-lands as we call them, or hills, where the land is not as good, and that would decrease the average. Yes, sir, that would decrease the average yield per acre as shown by the reports. That is true in other counties around Mitchell county, so far as I know. I think Ottawa and Lincoln and Cloud counties are similarly situated with respect to those rivers and valleys as Mitchell county." (2283.)

This evidence is sufficient to show that the valleys along the Saline, Smoky Hill, Solomon and Republican rivers are very narrow, and that these bottom lands are just as productive in the later years as in the early years, and that the average yield for the whole county has decreased because of bringing poorer land under cultivation. The evidence heretofore quoted shows that the Arkansas valley is wide and practically level; that the crops grown in these bottom lands are not grown to any extent on the uplands; that the Arkansas river is the only river in Kansas whose normal or average flow has been decreased in the later years; that the bottom lands in the Arkansas valley are the only bottom lands in Kansas whose productiveness has decreased in the later years as com-

pared with the early years; and that the average yield in the Arkansas river counties has decreased not because of a larger cultivation of inferior land in a particular crop, but because these bottom lands have been deprived of their moisture by the lessening of the flow of the Arkansas river.

These figures from the agricultural reports of Kansas were not relied on and introduced by complainant in its case in chief. These reports and figures were not prepared in such a manner as to throw any light on any issue in this case, even when explained by some one who understood them. In some counties along the Arkansas river fully fifty per cent. of the area is bottom land, while in many of the counties along the Saline, Smoky Hill and Solomon rivers scarcely five or ten per cent. of the area is bottom land, and is then even unaffected by the presence of the river. These figures being from the whole counties, and not from any particular sections or quarter-sections, were of no use, and hence were not used. But when the defendants introduced these figures with maps and diagrams, which were applied by a non-resident professor of mathematics to "valleys" instead of "counties," and with assigned causes and conclusions notoriously untrue and incorrect, then it was but just and proper that complainant in rebuttal should introduce actual witnesses who knew the actual facts, many of these witnesses living in the state and along these rivers nearly fifty years, and the facts testified to being part of their daily and yearly experience.

Counsel for Colorado refer to the lands belonging to the state of Kansas at Hutchinson and used for a reformatory and at Dodge City and used for a soldiers' home. All these lands are near the Arkansas river and many of them abut thereon, and all the bottom lands are affected as are the other lands in the Arkansas valley. Professor Carpenter in his second testimony limits the effect of the Arkansas river to a very narrow strip along the banks, and upon this point says that strip could not be over one thousand feet wide, and that he

thinks it is much less than that. To rebut this statement of his opinion many witnesses were introduced on rebuttal, showing that this effect extended in many instances miles back from the river, and in general back to the foot-hills or uplands. To show the effect upon the state lands at Dodge City, and its distance from the river, Captain Thomas, commandant of the Soldiers' Home, says:

"As to whether the average flow of the river, exclusive of floods, for the last five or ten years is less than it used to be, I will say, that since my knowledge of it, along about in the beginning of 1895, it is less, except in seasons where there are other causes that bring up freshets; but in the regular season it is not so great. As to whether the lowering of the water in the river affected those state lands beneficially or injuriously, I will answer that by stating that we put wells down for water purposes there in the home in 1894 and 1895, and about a year or such a matter after that we drilled deeper to catch up with the flow of the water. The level of the water beneath had gone down, and we were compelled to dig these wells deeper for that reason, yes, sir.

"As to what change has taken place along the state lands owned by the state of Kansas in respect to the banks of the river and the channel, I will answer, the only change I see is this, there has a network of islands been formed along that channel along the home lands to such an extent that when a freshet comes the main channel of the river has been disturbed by reason of these islands growing up in there. It is a regular network of islands. It has thrown that current very heavily against the home lands. There were some of those islands there in 1895, when I went there, but there are a number of others that have sprung up since that time. As to what caused the growing of those islands, I will answer, it has been the absence of water—no flow. It has been so that we could walk across there in some seasons for the entire season without getting our feet wet. . . . As to how far back from the river the high water in the river affects the level of the underflow, I will answer, as far back as that bottom extends. I might say to almost the base of the hill. And that is a quarter of a mile, perhaps more. Yes, sir, more in some places." (1941, 1948.)

Mr. Timmons, of Dodge City, says:

"Yes, sir, I used to live down at Arkansas City, and I have lived at the fort continuously since 1892, with the exception of the one year.

"Yes, sir, I heard the testimony of Captain Thomas this

forenoon and heard him refer to the ice pond. That ice pond was a small lake about 200 yards or so on the north side of the river, and it had considerable water in it, probably four feet. We had fish in it. We put fish in there along in 1894, and in the winter time we used the ice out of it. It was a natural lake at that time. It was always full of water. It was full of water for three or four years. I don't remember what years now. I can't give you the years in regard to that, but with the exception—I know it was in 1894 or 1895 that we put the fish in, because Colonel Cunningham was commandant of the home at that time, and it was under his direction that the fish were put in there, and there was a continuous lake there—I don't know how long it had been there before—but there was a continuous lake there for some years, probably until along about 1895, and after that it went dry and we had to take the fish out and put them in an artificial lake. As to how long that pond remained dry, I will answer, it is dry yet, with the exception of some small amount of water, probably five or six inches or something like that, in it now. As to where that lake gets its supply of water, I will answer, we always supposed from the river. There was no channel flowing from the river directly over the surface into it, no, sir. As to whether its source came from the underflow, I will answer, we always supposed it—we always supposed that the pond or lake as we called it was fed by the river from the fact that when the river went dry the pond went dry, and when there was water in the river the pond was full. But it did n't flow in from the river over the surface of the ground." (1950.)

Mr. Young, of Dodge City, says:

"As to whether or not on my ranch and along the river the water is nearer the surface under the bottom lands when the river is up than when it is low or dry, I would say it was, yes, sir. As to whether the level of the water under the bottom lands corresponds with the condition or the level of the water in the river, I will say, yes, sir. As to how far back the condition of the river affects the level of the water that I have just spoken of, I would say that varied a good deal according to localities. In some places it might be a hundred yards and in other places it might be five miles. As to whether I know of places where the river will affect the level of the water under the land five miles back from the river, I will say, yes, sir, it is apparent in the wells I have. The way I account for it is, you take a week or two or three weeks after the river flows full, the water is higher in those wells than it is during dry periods. Those wells are located on the south side of the river on my ranch, and the particular well I speak of is located three or four miles from the river. As to

whether from the condition of the water in that well I could tell the condition of the water in the river as it was a few days prior to the day of observation, I will say, I could not now, because I have converted the well into a tubular well, but in former years this was an open well. When it was an open well it was noticeable that it was higher during flood periods, or after the flood or high water had continued for a period of time. It was noticeable back that far from the river, yes, sir." (1958.)

Mr. Northrop, of Dodge City, says:

"As to what effect the lowering of the water in the river has had upon the underflow, I will say, well, this what we call the underflow varies with the water in the river. Now, as an illustration: When I was working with the ditch company I had charge of the construction department, on the south side. When we were going to put in a well at one point we got the engineer to take the levels. After we got the elevation above the water in the river we could tell just exactly or within six or seven inches or a foot how far it was to water, because we struck the water just on a level with the river. As to how far back from the river that extended, I will answer, well, of course, that was on the bottom. Of course, we did n't get off the bottom in our work on that construction. We were on the bottom altogether. As to how far back that condition extended, I will say, I think probably three-quarters of a mile is as far as we got back. Yes, sir, when we dug those wells we found water on a level with the water in the river. Now, sir, it did n't make any difference whether the water in the river was high or low, we found it just on a level with the water wherever the water was, high or low. Yes, sir, if the water in the river was higher we found that water back three-quarters of a mile higher than though the river was lower. Yes, sir, the water varied back three-quarters of a mile as the water varied in the river. As to how far back from actual observation the river has an influence upon the level of the underflow, I will say, we did n't get more than three-quarters of a mile back from the river That is as far as I could state from my own personal knowledge, and from that observation it did have an influence three-quarters of a mile back. That was all along up and down wherever we worked and not at any particular point.

"What I know about the artesian wells south of here, as to whether they are affected by the condition of the river, is only from hearsay. The people that live down in that country and own those wells claim that they can tell whenever they have a rise in the river, because their wells flow slower. As to what effect the rise in the river has upon the underflow up and down the river above and below Dodge City, I can't say

that I know of my own personal knowledge any more than through Ford county. Yes, sir, it does extend through Ford county, and it does produce that condition down here at the Soldiers' Home. At the Soldiers' Home there is in the neighborhood of 450 or 500 acres of land, and probably half of it is bottom land.

"No, sir, I think the flow of the river during the dry seasons of the year prior to 1904 has not increased during the dry seasons in the last ten or twelve years. The flow of the river during the dry seasons of the year for the past ten or twelve years through Ford county has been lower for a longer period; and what I mean by that is, the river has been extremely low for a good many months at a time in the past ten or twelve years. It has been almost dry here for months, when years ago it was very seldom that we had extremely low water. As to how long these extremely low water periods lasted in the early years, I will say I don't remember ever having but two during all of those years, and one was in—well, I don't remember just what time, but in the spring, it was. And then it was for I should think probably six weeks or two months, and then we got what we called our June rise and freshets, and after that we had plenty of water right along continuously for several years. My recollection is that during the whole of the fall of 1903 and the winter of 1903-'04 and the spring of 1904 down to the first week in May the river was very low. There was no running water. There may have been some standing water in holes and places, but there was no running water a great deal of that time.

"As to what effect it would have upon the bottom lands along the Arkansas river in Ford county if the flood waters could be stored and used above here, as to decreasing the amount of flood water and increasing the amount of flow during the dry season of the year, I will answer, our bottom land here is certainly more productive at seasons when we have more water in the river. It makes a great difference with our hay crop and all other crops growing on the river here when there is water in the river for any considerable length of time during the summer. I think it would have a beneficial effect upon the bottom lands through Ford county to have the flood waters decreased and the flow during the dry seasons of the year increased. And that would extend to all the bottom lands in Ford county.

"As to the carrying capacity of the river through Ford county compared with the carrying capacity of the river as it was the first years I knew it, the waters being reckoned at the same height as judged by the banks, I will say, I think it is much less at the present time; and as to why, I say that it is because a good many of these old channels have filled up—grown up with trees and bushes. The channel is narrower

than it used to be, and that extends practically through Ford county, and that condition can be seen between Dodge City and Cimarron from the Santa Fe trains." (1929-1931.)

Mr. Riley, of Dodge City, says:

"As to the average flow of the river, exclusive of floods, for the ten years prior to last year being as large as it was during the first ten years I knew it, I will say, no, sir, it has not been. As to what effect the falling-off of the water during these last ten or twelve years has had upon the productiveness of my lands, I will say, it has a whole lot with me. In the first place, I used to have a hay-field down there and used to cut a great deal of hay on it. For the last ten years I have turned it into grazing pasture, and am also tilling or farming it, because it did n't produce grass enough to pay me. It was not producing the grass it had when I first went there. As to why it did n't, I would say, it did n't have that sub-irrigation. As to how far this condition extends up and down the river, I expect all along the line, as far as I know, to Colorado. As far, as I know. Everybody I hear, you know, I hear complaining of it. Yes, sir, I am acquainted with the lands three or four or five miles down the river similar to my lands, and the bottom lands along the Soldiers' Home. As to how the loss of water has affected the productiveness of these lands, I will say it has affected them just the same as it did the rest of us up here. As to what effect the taking of the water in Colorado during the last twelve or fifteen years for the purposes of irrigation has had upon equalizing the flow of the river, I will say it has decreased it in the dry seasons. Since I have lived here the length of the period of low water has increased during the dry season, yes, sir." (1904, 1905.)

Mr. Vincent, of Hutchinson, says:

"As to what changes I have noticed in the Arkansas river in the thirty-one years I have lived in the county, I think there is a much less volume of water flows down the Arkansas river than did in the earlier years. The Arkansas river has lately filled up with islands, and timber has grown there and brush, and the river I should think was about one-third narrower here at the town than it was in the earlier days. I think there is not more than two-thirds of the waterway that there was in the river-bed in the earlier days. . . . As to why those islands have grown up in the channel of the river for the last ten or twelve years, I will answer, I take it because there is not sufficient water in the river to keep the obstructions washed out. As to the carrying capacity of the river to-day to carry off flood waters in comparison with its carrying capacity twenty-five years ago, the water being at the same height as measured from the banks, I would answer,

that of course would only be my judgment, I should say not more than half. If the same volume of water should now come down that in the early days filled the river bank full, as to what effect it would have on the bottom land through Reno county, I will answer, the water would seek its level by percolation or sub-irrigation—spreading out. If the same amount of water should come down now that just filled the banks in the early days, as to where it would go, I will say that same volume of water that filled the banks in the earlier years, if it came down now at one time, it would simply overflow the river. It would have to. . . . As to what the effect the different volumes of water in the river have upon the level of the water beneath any portion of the city of Hutchinson, I will say the water rises and falls as the water rises and falls in the river. As to how far back from the river that condition extends, I will answer, I only know back some five miles, of my personal knowledge, and it does produce that effect back five miles from the river, yes, sir." (2086, 2087.)

Mr. Ploughe, of Hutchinson, says:

"Yes, sir, I know something about what is known as the underflow. As to how far back it extends from the river, I will say that to my knowledge it extends back to our irrigating wells. I have no absolute information further than that, but I know it extends to our irrigating wells, and they are about a mile and three-quarters directly north of the river. As to what effect a rise and fall of the water in the river has upon the underflow at that distance, I will say the water rises in our irrigating plant—in our wells—as the river rises, and it goes down or recedes in the well when the river runs out or when the water runs out of the river; and that is regardless of rain, yes, sir. Rainfall don't affect the well much." (2096.)

Mr. Bigger, of Hutchinson, says:

"In my own case,I have a cellar here. Just two weeks ago, when the river was full, my cellar, the cement on it was a little defective, and it came up three or four inches of water, maybe five inches, in the cellar, and as soon as the water went down—that water was just as clear as spring water, too, and it came in through the bottom of the cellar—and when the river went down it went away, all except little holes in the bottom of the cellar where it could n't get out. No, sir, the water in my cellar was not affected by any local rain. The rain never affected it when the river was low. It is the general pressure of the underflow that caused it. My residence is on Sherman street east, No. 309. . . . Yes, sir, I have noticed springs along the Little Arkansas river. They are on

the south and west side of it. I have had lands on the Little river, and they are on the west side." (2103, 2104.)

Mr. Collins, of Hutchinson, says:

"As to what changes I have noticed along the Arkansas river since the early days, well, I notice that the water has been dropping in the ground along the river. It is not so high in the ground as it used to be in those early days. As to the change in the appearance of the river, well, there are a great many islands in it now, more than in those days, and the islands are larger. They used to be very small, and now they are very large and more of them, and they are a great deal larger—most of them three times as large. The banks have been narrowing up to a certain extent all the time, and there is more timber grown on those islands, and as the water in the river dropped away the islands got larger and the channels filled up. They got bigger all the time, and trees grew up, and grass. . . . Yes, I spoke about the level of the water underground back from the river having lowered. Describing it more definitely, I will say, well, when this town was first laid out, when they began to dig holes around where the buildings are now, the water was within about four feet of the top of the ground, and now it is about seven feet, I think. I think that condition goes back just as far as the water can get through the sand. It at least goes back to the sand-hills, five miles back; and as to the south, it would go back until it got hard ground where it could n't penetrate very much. Yes, sir, I am familiar with some lakes or pools that in the early days had water in them constantly and have changed since that time. Well, here is Brandy lake, located down here ten or twelve miles east of here, that used to have considerable water in it. It used to be quite a lake, and there have been quite a good many fish in it, and I think some six or eight years ago it began to dry up and those fish began to die in it. I think that lake was fed from the river entirely. Of course, the surface-water that fell around it—the rain—put some water in it, but the principal thing that kept it up was the Arkansas river. As to whether the amount of water in the lake responded to the amount of water in the river, yes, sir, when the river was high there was plenty of water in the lake and when the river was low that lake began to diminish. As to other lakes or pools in the same condition, I have a fish-pond on my place right due north of here in the bottom, right at the foot-hills, and the water dried up about six or seven years ago. I put some fish in it and it had a pretty good stage of water in it then. It is on the west side of the quarter, near the southwest corner of the quarter; and then there were some springs on the east side of the quarter, and I dug a ditch from those springs to this pond, expecting to

feed it from the springs, and I did feed it and filled it up with water; but the river got low that year—I don't remember just what year it was then, about six or seven years ago—the river got low and the pond dried up." (2116, 2117.)

Mr. Watson, of Kinsley, says:

"My well rose there in Kinsley a little over a foot. The city well rose about the same. It is still farther back from the river than my well is, and I am nearly a mile from the river. The city well is fully a mile from the river; that is, taking a straight line from the river bank, I should say it was nearly a mile from the river. No, sir, those fluctuations of the water in these wells are never affected at all by rains. As to how far back the Arkansas river affects the underflow, I will say, from my experience and observation, I know absolutely that it is affected for a mile back from the river in the valley." (2121.)

These quotations might be greatly extended, but they must suffice. The lands of the state of Kansas are within the limits here described, and these lands have been equally affected with other lands similarly situated. It is absurd to contend that these lands could be unaffected by conditions that have affected all other bottom lands in the same locality. We have not abandoned our claim for injury to these lands owned by the state, as counsel suggest, but insist upon it. The injury to the state of Kansas is both direct and indirect, as shown in our former brief; it is positive and extensive, and the ingenuity of counsel can neither obliterate nor minimize it.

SECTION 4. The Defendants' "Broken River."

If the first paragraph of point II, on page 50 of Colorado's brief, stating that "From the earliest times the Arkansas river through western Kansas has been merely a bed of sand, with no flowing water during a large part of the year," were saturated with truth enough to keep it moist, many journeys of exploration up the Arkansas valley would never have been made, and many volumes quoted by counsel would never have been written; the Arkansas bottoms would never have been grooved by buffalo paths leading down from the uplands, and the only inhabitants of the valley would be the desert-haunt-

ing prairie-dog and the owl; hostile Indian tribes fighting for water and rich hunting-grounds would never have made Pawnee rock an embattled fortress; the Santa Fe trail would have wound along some river with water in it, and emigrant trains would have crossed a different section of the "American desert"; government forts and post-roads would have been established along really running streams; the Santa Fe railroad would have sought an actually watered valley; millions would never have been spent in irrigation ditches around Garden City; and settlers would have gone elsewhere, where water as well as land was a bounty of nature; for, according to this part of the Colorado brief there never was water enough in the Arkansas river through this part of Kansas to furnish drink for man, beast, or wild animal; never flowing water enough, except during an occasional short flood, to turn a wheel, to saturate a rood of land, or to furnish dispute sufficient to give a justice of the peace jurisdiction. If the statement of counsel were true, what located the Santa Fe trail from Ellinwood, in Barton county, Kansas, to Bent's Fort, near the west line of Prowers county, Colorado? What made this trail the great national highway across the plains for more than half a century? What kept Fort Zarah, near Great Bend, and Fort Larned and Fort Dodge alive? Was the Cimarron crossing, in Gray county, a barren ideality? What did A. B. Caldwell's ox-teams drink as he traveled along the Arkansas river between Ellinwood and the upper Cimarron crossing continuously during the twelve years from 1850 to 1862? What kept William Mathewson alive at his government trading-post with the Indians, near Great Bend, from 1853 to 1867, and kept him alive at Wichita ever since? What brought J. R. Mead and the Indians together as traders from 1863 to the time of their departure? What induced Robert M. Wright to travel the Arkansas valley and mow its meadows in 1859, and to assist in laying out Dodge City in 1872? What induced "Buffalo" Jones to commence digging

irrigation ditches around Garden City in 1879? Was it sand? Did "a bed of sand, with practically no flowing water during a large part of the year" do all this? Did "this strip of bare sand bed" bring the buffalo here from wide prairies to drink, and the Indians from a thousand miles here to contend for the choicest hunting-ground in all the West? This would be "to reason most absurd," and in fact arrant nonsense. Kit Carson and Colonel Inman are dead, but Caldwell, Mathewson and Wright knew the Arkansas river better than any other men who ever traveled its banks, and they are alive and have testified in this case; and J. R. Mead was trading with the Indians at Wichita before Professor Carpenter ever opened a geography in a schoolroom. Sand and accident did not do all these things. The misfortune of counsel in not knowing the facts has in this instance led them not only to the brink but pushed them over. By contemplating the acts of the defendants in this case their counsel have formulated a theory, and have set up this theory as a defense to the defendants' acts. Counsel must retain pleasant recollections of classic days; "*Solitudinem faciunt pacem appellant.*" These defendants broke the Arkansas river, and their counsel now plead its broken condition as an excuse for the breaking. They are not content with creating one miracle, but insist upon two. They make a Colorado river empty nowhere or drain through impervious rocks into a different drainage area; and they make a Kansas river rise in nothing or in dry sand. Two rivers, one without a mouth and the other without a head! One modern miracle might be endured, but two are too many. We must be permitted to protest.

Counsel quote from the description of Major Pike, who saw the Arkansas river in October, 1806. They omit his further description, found in the record, where he says:

"Sunday, November 16th.—After ascertaining that the Spanish troops had ascended the right branch or main river, we marched at two o'clock. The Arkansaw appeared at this point to be much more navigable than below, where we first

struck it; and for any impediment I have yet discovered in the river, I would not hesitate to embark in February at its mouth and ascend to the Mexican mountains, with crafts properly constructed." (757.)

They quote two sentences from Parkman's Oregon Trail, while the balance of the quotation on the same page is as follows, relating to the month of September:

"At this season, were it not for the numerous quicksands, the river might be forded almost anywhere without difficulty, though its channel is often a quarter of a mile wide. Our horses jumped down the bank, and wading through the water, or galloping freely over the hard sand beds, soon reached the other side." (635.)

They quote from Edward Everett Hale's Kansas and Nebraska, but omit the further quotation found in the record, as follows:

"It is said, however, that a steamboat can ascend at full water within twenty-four miles of the great bend—the point where the river gains its greatest northern latitude." (757.)

The description by Major Long is also omitted, which is as follows:

"The current of the Arkansas is much less rapid than that of the Platte, but the character of those two rivers in a considerable degree corresponds, in their widely spreading waters, of but little depth, running over a bed of yielding sand. The rise of the waters at Belle point takes place in the months of March and early April, with a less considerable freshet in July and August. But to this place navigation is seldom practical for keel-boats, from the month of August to February, inclusive, though the autumnal freshet of October and November frequently admits their passage." (758.)

The description by B. B. Smyth is also omitted, which is found in the record:

"The Arkansas bears evidence of being an older and maturer stream than the Kaw—perhaps because its bed is filled every summer with water from the mountains; perhaps because during each platonic winter there may be many summer seasons when the Kaw is bound in ice that the Arkansas is free to run." (758.)

That the Arkansas river is higher during the wet season

of the year than it is during the dry season of the year is as readily admitted by us as it is that these natural laws apply to it as to other rivers. That it has gone dry during periods of extreme and protracted drought is as readily admitted as that it has been dry during the greater portions of the years since the defendants appropriated all its waters in the upper state. But that its condition since the appropriation and use of these waters is no worse than it was before these diversions is unreasonable, unnatural, and against the evidence in this case. To argue that because it has been found low or dry during a few days in the fall of the year therefore it is low or dry during the balance of the year, ignores the natural conditions and the evidence taken. To argue that because it has been found to be low or dry for a few weeks even during two or three extreme droughts within the last fifty years therefore it is "merely a bed of sand with practically no flowing water during a large part of the year," is here *non sequitur*. By persistent advertising, a few witnesses were found in Colorado who had passed over the Santa Fe trail and found the Arkansas river either low or dry; but two things, however, are noticeable in this testimony, that these witnesses saw the river but once, or but a few times during a few days, and that these times were during the fall or low-water season of the year. These witnesses for Colorado did not live along the river nor travel its banks for weeks, months and years as did the witnesses for the complainant. They were travelers passing through the country and in many or most cases seeing the river on but a single trip, and even then inclined to compare it with the narrow, deep and swift streams of the Eastern or Middle states. But few persons ever crossed the plains or traveled the Santa Fe trail during the winter, spring, or early summer. This part of the trip was generally reached during the months of August, September, and October. Another thing is noticeable in the testimony of nearly all the witnesses produced by Colorado upon this point. They saw the

river but once, or at most but a very few times; these times were nearly always during August, September, and October, when the river was at its lowest flow, and it is truly remarkable how many of them saw the river for their only time during the notoriously "bad years" in Kansas history. On page 91 of Mr. Prentis's History of Kansas, he says: "From the 19th of June, 1859, until November, 1860, over sixteen months, not a shower fell to soak the earth." And again, on page 180 he says: "The 'bad years' in the first thirty years of Kansas, viz., 1860, 1868, 1870, 1874, and 1887, were followed by seasons of uncommon fruitfulness." The witnesses speak of the year 1879 as also suffering from drought. It is more than remarkable how the Colorado witnesses happened to see the river in 1859 or 1860, during the trans-Mississippi drought; during 1874, the "grasshopper year," or during the drought of 1879. The "natural selection" of witnesses was never more perfectly made. The total number of days they all saw the river would not equal the number of days one witness would see the river in one summer of one year who lived on its banks or traveled it continuously. The "broken-river" map they present was prepared in 1900, ten or fifteen years after the river had been continuously "broken" by the "breaking" operations above. It will be remembered that the Garden City ditches were mostly dug between 1879 and 1885, and that they all had plenty of water from 1880 to about 1887, and that during these years the river had not been "broken," but that its "breaking" immediately followed the construction of the large and extensive ditches in Colorado. If the state pressure were withdrawn counsel would see the humorous side of their "broken-river" argument. Prof. Willard D. Johnson would surely see the seamy side of their argument, for it was he who in 1901 wrote and published, on page 694 of his High Plains and their Utilization, as follows:

"The experiment of upland irrigation from the Arkansas river near Garden was at first strikingly successful. Three long canals and many miles of distributary ditches were con-

structed, and although the upland area thus brought under cultivation was relatively minute, and large profits resulting operated to hasten the discouragement of those who up to this time had been depending upon the meager rainfall alone. It failed in turn, however, because of increasing demands on the river in the arid belt to the westward, in Colorado, resulting finally in the drawing off of its total run during the growing season. It soon came to be facetiously remarked of this elaborate and well-devised irrigation system that it constituted the finest display of dry ditches in the arid lands.

"The out-of-season flow of the Arkansas at Garden still goes by, but large undertakings already on foot looking to storage in the mountains foreshadow the eventual complete disappearance of the river in western Kansas, except as it may from time to time be briefly rejuvenated by floods too large to be manageable."

This "broken-river" argument would cause Mr. D. M. Frost, president of the Board of Irrigation Survey and Experiment, to smile, for in their report to the legislature of Kansas for 1895 and 1896, on page 187, he says:

"Since 1892, the surface flow of the Arkansas river has gradually failed, until in the year 1896 there was scarcely any flow east of the Colorado line; not because there was any diminution in the water-supply at the sources of the river, but on account of the increase in the number and carrying capacity of these ditches constructed in Colorado, which absorbed all the waters, and thereby left Kansas ditches unsupplied." (1857.)

Professor Mead evidently had not heard of this recently manufactured "sieve" in western Kansas when, on page 320 of his Irrigation Institutions, he wrote:

"So little water runs in some of the rivers of southern California that the stream channels are now grown up with underbrush. Reservoirs catch the floods and ditches divert the ordinary flow. It is claimed that the diversion of water in Colorado is causing the bed of the Arkansas in Kansas to be filled with drifting sand. To water many Western valleys will involve drying up the streams which flow through them, and this physical fact ought to be faced frankly and honestly. The doctrine of appropriation contemplates using all the water, and if it is to be carried to its logical end, the rights of riparian proprietors on many streams must be encroached upon."

Such is the fate of a popular government officer because he

prepared his work before the "sieve" theory was given to the world in the brief of Colorado.

Mr. William E. Smythe did not know that from time immemorial the waters of the Arkansas river had been continually dropping through the bottom of a sieve, when, on page 111 of his recent volume on The Conquest of Arid America, he wrote:

"When the Kansas irrigators found themselves deprived of their surface supplies they sought the underflow, and in the process of finding and utilizing it developed an entirely unique and very promising mode or irrigation."

Mr. Smythe should have waited until after April 16, 1906, when this Colorado brief was filed, to publish his interesting volume."

It is known to all persons, and was fully established by the evidence of the intervenor in this case, that the Rio Grande through New Mexico has many of the characteristics of the Arkansas river through Kansas, and it was testified again and again that irrigation in the San Luis valley in Colorado had materially decreased the flow of the Rio Grande through New Mexico (1093, 1099, 1106, 1110, 1123, 1141). The resulting injuries to the citizens of Mexico caused constant complaint, and an International (Water) Boundary Commission was created, consisting on behalf of the United States of Brigadier-general Anson Mills, U. S. A., retired, commissioner; W. W. Follett, consulting engineer; and W. W. Keblinger, secretary. After an extensive examination, and on November 17, 1896, Mr. Follett's report was published, and on page 300 of volume 2 of the report of the commission the following conclusions are found:

"Their recapitulation is as follows:

"1. The fact of a decrease in the flow of the river at El Paso exists, as claimed, and dates back to 1888 or 1889. Before those years the river went dry at intervals of about ten years. Since 1888 it has been dry every year but two.

"2. The use of water for irrigation has not materially increased in New Mexico since 1880, and hence is not the cause of this decreased flow.

"3. The use of water in the San Luis valley of Colorado has very largely increased since 1880, and at the present stage of development it takes from the river, in excess of what was taken in 1880, an amount of water equivalent to a flow of 1000 second-feet, running for 100 days; at least this amount is taken, and possibly more.

"4. It is impossible to state specifically how much water was in the river prior to this increased use of water and since, as the records do not antedate this increased use, and as the flow since the records began varies within very wide limits.

"5. This flow of 1000 second-feet, if allowed to remain in the river, would do much toward preventing a dry river at El Paso. Hence,

"6. The Mexican and American citizens of the El Paso valley have suffered in common with their neighbors of the Mesilla valley and those still farther up the river by this Colorado increased use of water. The suffering has been greater in the El Paso valley than elsewhere.

"7. All of the summer flow of the streams in the San Luis valley, except their flood waters, are now appropriated, and therefore the use of water therein for direct irrigation is not likely to materially increase in the future."

"12. There is not a sufficient water-supply in sight to serve both the Elephant Buttes and El Paso reservoirs, and one scheme must give way to the other. If the United States government can find any way to control the storage of water at Elephant Buttes, such control should be exercised. If that dam is built at all, its use of water should be conditional on its stopping no flow when the supply of water at El Paso is short."

These conclusions from these public documents would have been quoted in our former brief if we had had access to the report at that time. On November 25, 1896, the joint commission made a report, and on page 280 of volume 2 is found the following:

"It will also be observed that the greatest increase during these sixteen years was in the state of Colorado, the number of canals and acres irrigated remaining almost stationary in New Mexico for that period, but this is easily accounted for by the fact that the appropriation of water in Colorado has rendered such a scarcity in New Mexico that little further increase of canals and acreage was profitable.

"It is evident to the commissioners that as the flow of water in the Rio Grande had not only become scarce at El Paso, but high up in New Mexico prior to 1888 or 1889, an increase

of water used in Colorado would diminish materially the flow at El Paso during the irrigation season. . . .

"During a part of this time measurements at Embudo, on the Rio Grande near the Colorado line, showed that the flow at that point was greater than at El Paso, there being no increase in the flow from Embudo to El Paso. This fact is mentioned to show that the supply of water both in New Mexico and in the valley of El Paso depends for the greater part upon that of its head waters in Colorado.

"An examination of the old canals in use in the El Paso valley some thirty years ago convince us that those on the Mexican side had a capacity of about 300 second-feet and that those on the United States side had a capacity of about 250 second-feet.

"Many of these for the past five years have been constantly dry, and all of them have been dry for a great part of the irrigating season three years out of the five past."

On February 18, 1901, Brigadier-general Mills, on page 374 of volume 2, reported as follows:

"In conclusion, I beg to state that, while I am an American before I am a Mexican, each step I have taken in this investigation during the past twelve years has progressively impressed and confirmed me in the opinion that Mexico has a righteous and just cause of complaint, and that the redress asked for is the only practical one and ought to be granted, for a money indemnity would reach only a few of the actual sufferers, and those after long delay and amounts much diminished by intervening agents; and though I have been repeatedly solicited, both by representatives of the Elephant Butte company and the citizens of El Paso, Tex., to modify my recommendation so as to permit the construction of the Elephant Butte dam without federal constraint, I cannot, under my oath of office and my best understanding, find myself able to do so, and outside of my official duties I could not be instrumental in encouraging the fruitless expenditure (save benefits from local disbursements) of over $2,000,000 to build such a colossal wall, without water, to stand as a monument to my imbecility."

These complaints by the citizens of Mexico and the investigations of the joint commission resulted in the litigation between the United States and the Rio Grande Dam and Irrigation Company which is reported in 51 Pac. 674; 174 U. S. 690; 65 Pac. 276; 184 U. S. 417; and 85 Pac. 393. These complaints, reports and this litigation were finally ended by a treaty between the United States and Mexico, which was rati-

fied by the senate in June, 1906. This treaty is not quoted here because we are informed that the same has not yet been published, but we understand that it closely followed the preliminary treaty, found on pages 334 and 335 of volume 2 of the report. Certainly this commission had not heard of the "sieve" or "broken-river" theory advanced by counsel for Colorado, or this treaty and its attending millions of expense might have been unnecessary, and any injury to citizens of New Mexico might have been avoided.

SECTION 5. Seepage in the Arkansas Valley.

Counsel for the state of Colorado in their brief have originated and developed another theory, which is to them both pleasing and captivating. Their theory is that the more water they use from the Arkansas river in Colorado the more even is the flow of the river during the dry season of the year through the state of Kansas. Under one condition this theory would be true. If they should impound the flood waters of the river during the wet season and then turn them loose gradually during the dry season undiminished and unimpaired, leaving the normal flow undiverted, then the flow of the river below would be rendered more even and uniform. But this is just what they do not do along the Arkansas river in Colorado.

First: By far the greater portion of the diversions in Colorado are made during the growing and summer season of the year, and during this time, between Pueblo and the state line, all of the water is used, and then they do not get enough to supply the demands of their ditches, and the dryer the season the greater the effort to capture it all, and none is permitted to escape into Kansas. The testimony upon this point is quoted in our former brief, on pages 127 to 131. The time during which this water is all taken each year is being annually lengthened, and even winter irrigation is now being favorably considered and extensively followed.

Second: All the witnesses agree that at least two-thirds of

the water diverted into irrigation canals and ditches and spread out on the land for irrigation purposes is lost by evaporation and absorption by plant life, and only one-third is left to sink into the ground, and under the most favorable circumstances can ever find its way back into the river below.

Third: It is absolutely and conclusively shown by the witnesses and officers of the state of Colorado that the canals and ditches along the Arkansas river between Pueblo and the state line are so located that each one in succession takes all the water naturally in the river at its head-gate, together with all the seepage or reurn waters coming back into the river above that point. This testimony is outlined in our former brief, on pages 115 to 122, and the particular testimony of Mr. Creassy, the water commissioner at Rocky Ford, Colo., is as follows:

"In speaking in my testimony yesterday about seepage water from the ditches in Colorado getting back into the river, I would say the seepage water from the Bessemer ditch would return to the river all along its course down as far as the Huerfano river, and its lowest end would be in range 62 west. Bob Creek ditch would deposit seepage water back into the river along its course as far east as range 56. The seepage water from the Bob Creek canal does not return to the Arkansas river, so far as I know, east of range 58. At that point it leaves the river and there is a dividing ridge running along in ranges 56 and 57, and I don't know of any seepage water having yet found its way back to the river, unless it would be into Horse creek, in range 56, and passing down the course of Horse creek.

"The Highline ditch would deposit seepage water along its entire course as far, possibly, as the east side of range 50. The Oxford Farmers' would deposit seepage water from its head down as far as the Apishapa, on the west edge of range 58.

"The next would be the Otero canal, which, if completed and repaired so that it would use water during the flood seasons of the year, and if extended as the intention now is, would deposit seepage water as far east as range 53.

"The Catlin canal would deposit seepage water as far as Timpas creek, on the east line of range 56.

"The next in order would be the Holbrook ditch, which would deposit seepage water into the river proper as far east as the center of range 55, and also seepage water into Horse creek, along in range 54.

"The next would be the Rocky Ford, which would deposit seepage water as far east as Timpas creek, in the east side of range 56.

"The next is the Fort Lyon canal, which deposits water along the river and also into Horse creek, Adobe creek, Gageby creek, Limestone creek, Graveyard creek, and as far east as the west line of range 45.

"The Las Animas town ditch and the Jones ditch would deposit water into the river and the Purgatoire as far east as the east line of range 52.

"The Colorado-Kansas, Bed Rock and Kisee ditches, which take water out of the river at the same head-gates, would deposit water. as it is now constructed and used, as far east as the east line of range 45.

"The Amity ditch would deposit seepage water into the river, Sand creek, Buffalo creek, and as far east, possibly, as the creek that empties into the river east of the Colorado-Kansas line.

"The Lamar canal would deposit seepage water, as it is now built and used, probably as far east as the center of range 43.

"That is all, excepting the little ditches. The seepage water from all these canals that return water to the river west of the Amity canal would be used by the Amity canal when it needed it, unless it would be the seepage water filling up the sand of the river that don't come to the surface at that point. But if they come to the surface below the head-gate of the Amity canal and by that means increase the flow of the river, they would still simply reenforce the lower ditch, if there were a lower ditch that needed water.

"The main effect of all this seepage water is to increase the amount of water used by each ditch below the point where this seepage water returns to the river." (923, 924.)

This testimony shows that all the seepage or return waters are used in Colorado, and none gets into Kansas except the seepage from the lowest ditch, which is too small in amount to be considered. Under this testimony, the facts sworn to by the Colorado officers contradict the theory set up by the Colorado attorneys, and it further shows that in the future the return waters from Colorado ditches can never get into Kansas because the wants of the irrigators are constantly increasing far in excess of the water-supply in the Arkansas river. The arguing of this theory shows the futility of the defense to this action. If this theory were true even to a

limited extent, the recent treaty with Mexico regarding the Rio Grande would have been unnecessary, and the commission to treat with Great Britain in regard to the Milk river would never have been appointed. Mr. Dunton, a witness for the intervenor, says:

"On the South Platte, in Colorado, undoubtedly the entire flow was fully appropriated for direct irrigation by ditches with priorities prior to any ditch ever taken out in Nebraska. . . . The stream is largely overappropriated in every district in the late season in Colorado, and they get every drop of water they can out of it, and the effect of this is that there is nothing but a dry bed of sand from Julesburg to the junction, which I should roughly guess is about a hundred miles, and the effect of this reduction is that there is no water that flows across there at all.

"I stated in my direct examination the effect of Colorado taking all of the water of the Laramie river and that it would injuriously affect the irrigation of the Wheatland system.

"As to the percentage of waters used for irrigation that return as seepage to the stream, that depends entirely upon the character of the soil, the distance to which the water is taken, and the use that is made of it. There is probably an average of one-third of the water diverted seeps back into the river. If these diversions should be repeated over and over as you go down the river, undoubtedly it would be possible to divert the entire body. The only seepage water that would go on down the stream so as to be a part of the flow would be the seepage from the ditches lowest down. The seepage water to get back into Nebraska so as to affect the flow in that state must come into the river below the head-gate of the lowest ditch, if the lowest head-gate is taking all of the water in the stream. When the lowest head-gate is taking all of the water in the stream the seepage that will get back into the river so as to affect the flow of the river below must be below that head-gate. . .

"The North Platte and the South Platte differ very largely. The Arkansas river, so far as I am acquainted with it, is quite similar to the South Platte after it gets down into Nebraska, where it spreads out along the sands." (1072, 1073.)

Mr. Hall, another witness for the intervenor, says:

"As to the Rio Grande river being dry during the last spring, I think it was in March that I first saw it or first went to it and examined it, and from that time until August the river was practically dry as high up as Rincon and at least to below El Paso. As to the cause of the river drying up, not

having known the river before, I would simply have to give an opinion of that cause as gathered from the statistics that I have seen. From the investigations of others and in the official reports of Mr. W. W. Follett, the engineer for that International Boundary Commission, it was stated that in the Rio Grande basin in Colorado, from the year 1880 to the year 1896, there had been an increase of irrigation of 197,000 acres in the San Luis valley, mainly in the state of Colorado on the head waters of the Rio Grande, and that this irrigation was not from impounded water but from direct diversion of what would be called the regular waters of the river—what ought to go to make the constant flow during the irrigation season and not the flood season—and that this was placed as the cause in those investigations of the shortage of the water down in New Mexico as well as in Texas and old Mexico. . . . A large percentage of it is evaporated and used in plant life. That portion is a permanent loss to the river at the time of the irrigation season." (1140, 1141.)

Professor Mead, another witness for the intervenor, says:

"I suppose in the Arkansas valley the diversions are made beginning as soon as you can get water in the ditches—March or April—and along as late as September. The main diversions, probably, in the upper part of the stream, are in May, June, and July. The main diversions in the lower part, as I explained this morning, fluctuate greatly in different years, depending on the effect of storms and rains, and some of those come later. As to the general proposition and to what proportion of water that is diverted for irrigation is evaporated and absorbed by plant life, I will say, taking the large number of measurements we have made and those we have collated, about two-thirds of it.

"Yes, I am the author of the book called 'Irrigation Institutions,' and this statement corresponds to the statement made by me in that book on page 320." (1390.)

Mr. Fellows, another witness for the intervenor, says:

"It would be impossible to answer with any degree of accuracy what has been the average percentage of evaporation and loss of water by absorption by plant life in irrigation, even in the same county or along the same stream, because they vary so widely that it is utterly impossible to give a very specific answer; but in general I should say that we may assume that of water applied in not too great quantities in irrigation perhaps fifty per cent. should enter into plant life, twenty-five per cent. pass off in evaporation, and twenty-five per cent. flow back to the stream as return or seepage waters. . . . If a system or a series of canals for irrigation should be carried on for 200 miles along the river, taking during the

irrigating season all of the water, and seventy-five per cent. of that should be evaporated and absorbed, it would have a very great effect upon the total flow." (1066, 1067.)

Mr. Johnston, another witness for the intervenor, says:

"Undoubtedly the larger percentage of the water which is used for irrigation is lost through evaporation. There is no question in my mind about that. And it would be my judgment that it runs from seventy to eighty-five per cent., from the figures I have been able to secure; that is, that seventy to eighty-five per cent. is either lost by the evaporation from the ground, from the surface of the water in ditches or through plant life, or escapes underground in a way that cannot be accounted for." (1029.)

Professor Carpenter, a witness for Colorado, says:

"From one-half to two-thirds of the amount of water used in irrigation is evaporated and goes into plant life. If 750 cubic feet should be used for actual irrigation, from one-third to one-half might find its way back to the river and from one-half to two-thirds disappears by evaporation, leaving, then, only one-third to one-half to go back into the stream. If one-third finds its way back into the stream by one use for irrigation, when that would be used the second time the same rule would apply, and after two usages there would be about one-ninth of it left, and when this should be used the third time, about one twenty-seventh." (763.)

Applying the facts here given in testimony to the numerous and successive diversions as described by the Colorado witnesses, the theory set up and gravely argued by counsel for Colorado becomes a humorous absurdity. This decreased flow began to be noticed about 1888, and by 1893 the river as it had formerly flowed was gone. It was *post hoc*, and it was *propter hoc*.

On page 156 of Colorado's brief counsel refer to Colorado's exhibit No. 1, and say this picture shows "A practically normal representation of the perennial Arkansas at Arkansas City." For this statement by counsel we can think of no excuse except the excuse of misinformation on the part of the writer of that sentence. This picture was not introduced by any witness who took the same, but was gotten into the record

as part of the cross-examination of Mr. Hess, a witness for complainant, and his testimony is as follows:

"This picture looks something like the dam. The picture shows that it is high water. If that picture is true, and if it was taken on the 10th day of August, 1903, I should say that at that time the water was high in the Arkansas river at that point. . . . There was a rain on Saturday night, July 12, and one on July 14, 1903. I am using a memorandum I made this morning and last night to refresh my memory, the data being taken from the daily papers. I know that last year the rainy conditions were abnormal. We had more rain in the summer months than we had before. I think we have had much more this year than last year. I have a record of those years of high water. (Examining defendant Colorado's exhibit 1.) When that picture was taken the river was higher than ordinary at that time, but whether there was a flood condition I don't know. Examining the picture taken in August, 1903, I would say it was taken at high water. It was taken at water that had been higher a day or two before. There had been a flood a day or two before. The water was several feet higher.' (414, 415, 421, 422.)

Some hallucination must have seized counsel who wrote the brief on behalf of Colorado to induce him to insert that photograph with such a comment.

Counsel is equally unfortunate in reference to the pumping of sand below the Douglas Avenue bridge at Wichita lowering the bed of the river. The sand pump is a quarter of a mile below the bridge (2149, 2163), and the abutments at the west end of the bridge stand above the level of the dry bed of the river as far as the abutment at the east end of the bridge stands above the small flow of water coming from the Little Arkansas river. Counsel had forgotten that they do not pump sand from a dry river-bed.

In these flights of fancy counsel, however, have been merely following the witnesses for Colorado who have furnished some choice bits of romance. Mr. Lynch, of Pueblo, testified as follows:

"The river was dry four-fifths of the time at Oxford—easily that. Really, I believe it was more than that. I think it was nine-tenths of the time. It was dry pretty nearly all of the time at Oxford." (927.)

Oxford is below the Little river, the Cowskin, and the Ninnescah, and at Oxford the river never went dry in all its history (1761, 1765, 1783, 1793, 2119, 2228).

This climax can only be equaled by Mr. Fosdick, of Rocky Ford, who, on page 889 of the record, testified as to the condition of the river and the size of the flock of ducks, and that with a .45 revolver he "killed seven of them with one bullet," and that "there was n't water enough to float them." The number of ducks he killed must have grown greater as the river grew less in his recollection. Colorado pressure must have been stimulating in one direction and exhaustive in another. If Mr. Lynch had only told us how many men in buckram suits Falstaff would have encountered if he had not been interrupted by the Prince, and if Mr. Fosdick had only told us that the seven ducks he shot were dressed "in Kendal green" and "it was so dark that thou couldst not see thy hand," then this evidence would indeed have been "open, palpable."

But all this testimony of the Colorado witnesses with uncertain recollection is surpassed by the testimony of Professor Carpenter concerning the level of the underflow as determined by two lines of wells and measurements run by his experimenters, and testified to by him on pages 686, 687 and 688 in his direct examination, and on pages 759, 760, 761, 762 and 763 of his cross-examination; and also on pages 1805 to 1817 on redirect examination, and on pages 1847 to 1849. This testimony should be read in connection with the testimony of Mr. Brown, found on pages 2159 to 2164, and complainant's exhibits Nos. 62 and 63, and in connection with Colorado's exhibits Nos. 24, 31, and 32. As this testimony and these measurements lie at the basis of counsel's theory of the level of the underflow, and the dependence of the underflow upon the flow of the river, it is necessary to give it a careful examination.

The Colorado observers ran two lines of wells, one known as the Mount Hope line, and the other the Colwich line. Some

other lines were run, but all the testimony centers round these two lines.

Professor Carpenter testified again and again that the wells established along these two lines showed that the level of the water rose as they went "away from the river," or "back from the river." He admitted on cross-examination that these lines were run due north from the bridge at Mount Hope and from the bridge at Colwich. Professor Carpenter says:

"The line north from the Mount Hope bridge ran about seven miles. There was a considerable rise there in the water-level above the water-level in the river at the bridge. I do not recall just those figures. The measurement of one set of wells was made directly on that line running directly north of the bridge. . . . The measurements made on the Colwich line were begun at a bridge as it crosses the river, I think on a township line, and I believe also a mile east of Colwich. It was the bridge nearest to being north of Colwich. The bridge was practically a mile east and four miles north of Colwich, and is located on the southeast quarter of section 27. These measurements were run both north and south from the bridge. We found, south, that the line is running almost parallel with the river, and that the wells running down the river were lower than those up the river; that is, well No. 3 was lower than well No. 1 near the bridge. This is practically the same thing that they found south of the river at Mount Hope. The river in both cases runs southeasterly, although at the Colwich line it runs almost south, close to the road. When they went north from the Colwich bridge they found an increase in the height of the water." (760, 761.)

To rebut this testimony and explain these conclusions, Mr. Brown, the surveyor of Sedgwick county, and the city engineer of Wichita, made a survey of these same lines, and prepared exhibits 62 and 63. The measurements themselves were found to be correct, but the conclusions drawn by Professor Carpenter are absolutely startling, and if unexplained would amount to misleading the court. The cross-examination of Professor Carpenter and exhibits 62 and 63 show that the Colorado observers, instead of running their lines "away from the river" or "back from the river," and thus finding a higher water-level as they went further, in truth and in fact

were running their lines "up the river" and were getting their higher water-level by that means.

Mr. Brown ran over the same lines established by the Colorado parties, and these lines are shown on exhibits 62 and 63, and the level of the water in each of the wells. The river at Mount Hope and at Colwich runs southeast, and the lines run directly north. Mr. Brown ran a line from each of these wells to the river, striking it at right angles to the course of the river, and then found that the water in each of these wells was on a level with the water in the river at the point where the line drawn at right angles struck the river. The level of the water in the well four and one-fourth miles north of the Mount Hope bridge was 15.16 feet above the level of the water at the bridge, and was on a level with the water in the river about two and one-half miles up the river, where the line strikes the river drawn at right angles to the course of the river. (Exhibit No. 62.) The level of the water in the well four and five-eighths miles north of the Colwich bridge was 10.64 feet above the level of the water at the bridge, and was on a level with the water in the river about two and one-half miles up the river, where the line strikes the river drawn at right angles to the course of the river. Through this part of the county the river has a fall of from four and one-half to six feet per mile. These figures show that instead of the water-level rising as you go back from the river it is on a level with the water in the river at the nearest point, or is below it, and is always below the level of the water in the river at a point where the water would leave the river to reach these wells. So the water runs from the river to these wells instead of from these wells to the river. Professor Carpenter overlooked the fact that these lines of wells were going *up* the river instead of *away from* the river, and hence his conclusions were erroneous and entirely misleading.

But these measurements show only a part of the truth, which other parts of the evidence fully reveal and establish. If these lines had been further extended they would have

reached the valley of the Little Arkansas river on the north, and would have reached the Cowskin on the south. As shown in our former brief, the bed of each of these streams is lower than the bed of the Arkansas river at corresponding points. So, if the current of the underflow should run toward the Arkansas river, at all points along the river, at least below Garden or Dodge City, it would have to run up-hill when it could at the same time run down-hill, and this it refuses to do, even to support the theory of Professor Carpenter and the argument of counsel for Colorado. These tributaries always correspond to the flow of the Arkansas river, and the springs are always on the Arkansas river side, and these tributaries and the underflow as far as it extends always rise and fall following the rise and fall of the river. The measurements of Professor Slichter prove this as far as his measurements went; but his measurements which were made with any sort of carefulness were all confined to the vicinity of Garden City. Professor Johnson spent but a few weeks in the Arkansas valley, and this also was in the vicinity of Garden City, and while he did not understand the topography and the elevations, nevertheless he came near telling the whole truth in his article "High Plains and their Utilization," referred to by him on pages 1222 and 1226 of the evidence. On pages 647 and 648 of the conclusion of this article, Professor Johnson says:

"There is a single local exception to this rule of stream depletion. The Arkansas valley near Garden is shallow, though wide. The direction of slope of the ground-water here is southeastward, toward the 'breaks' and deeper valleys in that direction; and, for a few miles, the river, on a more nearly eastward course, runs on a level with the ground-water surface, though at an angle across its slope, so that the dip of the water-plane is toward it on the north and away from it on the south. From the mountains to this point, however, the dip on each side of the valley is streamward; to the east, for a considerable distance, it is on each side away. That is, to the westward the river runs below the upland level of the ground-water. The ground-water there contributes to its flow; to the eastward it runs above, and is depleted in turn.

In the neighborhood of Garden the river receives contribution on the one side, and on the other loses.

"The Arkansas, along most of its course across the high plains, has changed its habit, from degradation back again to building. There are topographic evidences to this effect for fifty miles eastward from Dodge. There is strong suggestion that by fan construction in the high-plains region it has lifted itself out of a former deep valley and shifted to another course, the deep valley thus abandoned being that now occupied by the feeble Cimarron. In other transecting valleys terracing is suggestive of vertical shiftings of the level of stream equilibrium, but there is no other instance, so far as the writer is aware, of valley abandonment by this process."

A few facts from the evidence show this statement in much stronger light. The elevation of Meade is 2517 feet, and is 30 miles south and 2 miles west of Cimarron, and is 108 feet below Cimarron. Jetmore is 20 miles north and 8 miles east of Dodge City, and is 216 feet below Dodge City. In section 7 of our former brief it is shown that the Pawnee river, Coon creek, Rattlesnake creek, Cow creek, Little Arkansas river and Cowskin creek are all throughout their main course below the bed of the Arkansas river at a corresponding point, and that the springs which feed these tributaries, especially during the dry season of the year, are always found on the Arkansas river side. Complainant's exhibits 62 and 63 show that near the river the level of the underflow is even with the level of the river at right angles, and if the lines of these surveys had been extended north they would have found a lower level in the lower valley of the Little Arkansas, and if extended south would have found a lower level in the lower valley of the Cowskin. With this topography and these elevations clearly understood, the flow of the river, the effect of the upper diversions, the connection of the underflow with the amount of water in the river, the effect upon crops and productiveness, the injuries set out as extending throughout the valley since the depletion of the river above, can all be easily comprehended. With these things understood, it is easy to see how the river feeds the underflow and these tributaries, and how the taking the

water above in Colorado leaves that much less water in the river below in Kansas, and how the underflow has been lowered in recent years. During dry years in Kansas this amounts to the difference between a supply and a want; between a plenty and a scarcity; between having what was our own and suffering an injury inflicted by the defendants. That the Colorado witnesses did not understand the Kansas conditions is plain, and it is equally clear that the Colorado counsel have been led into the same false position. That this may have been unintentional does not militate against the fact. Their understanding was imperfect, and their premises being false their conclusions are wrong. The laws of nature cannot be reversed or set aside merely for the convenience of the defendants or their counsel.

SECTION 6. Defendants' Witnesses in Kansas.

After the defendants had exhausted their resources in securing evidence in Colorado they came to Kansas, and having plenty means for investigation, ample time and opportunity, and the powerful process of a federal subpœna, they procured seventy witnesses who testified on their behalf. These witnesses were found along the Arkansas river between Coolidge and Oxford. The evidence of these witnesses is found in the record, from page 1454 to page 1805. Some of these witnesses were men who pay but little or no attention to natural objects and surrounding conditions, and hence counsel could get them to say that they had not noticed any material change in the flow of the river, or the level of the underflow, and had not heard any complaint on the part of their neighbors. It may have been true that some of these witnesses neither noticed anything nor saw anything in regard to these natural objects, and if they had all been as deaf as Mr. Swarens, of Hutchinson, they could not have heard a complaint unless it had been shouted through a megaphone. Many of them had made no more careful observations than had Mrs. Leasure, of Larned, the lone woman in the case, who

only knew of the level of the underflow by her observations at a drive-well (1569). The greater number of these witnesses were induced to testify on behalf of Colorado because they had been injured by the floods of 1904 and 1905, and these injuries were fresh in their recollections. Many of them owned the lowest lands along the river-banks, and the drying-up of the river and narrowing of the river-bed had greatly increased their acreage, and of this they were making no complaint, for while their neighbors further back from the river were being inflicted with increasing injuries they were deriving some small benefits by having some new made land added to their possessions, and the fact that this made land was between the meander lines of the river caused them no uneasiness. The land of Mr. Williams, of Wichita, extends five miles along the river and only three-quarters of a mile back from the river at its farthest point (1708). Mr. J. W. Sites, of Wichita, owns 800 acres of land, but 300 acres, however, are in the big slough near Colwich, and these lands were overflowed for weeks in 1904 and 1905, with water in many places "up to the buggy box." (1743.) The land of A. J. Shore, of Oxford, was overflowed by the flood of 1904, and so he was prepared to testify on behalf of Colorado. The land of J. M. Buffington is low bottom land along the river at Oxford, and he says: "I expect there are places it would n't be more than a foot deep to water," at the time his testimony was taken (1792). These statements are common to so many of these witnesses selected by counsel that no more extended notice is needed.

These witnesses living in Kansas who testified on behalf of Colorado told practically the same facts as described by the witnesses for the complainant: that the river in the early years had a reasonable and uniform flow; with a June rise in the spring and lower water in the fall, not greatly affected by local rains unless falling in torrents; that the underflow corresponded with the water in the river throughout the bottom lands; that since the diversion of the waters of the river

for irrigation in Colorado the June rise came no more, the river was low or dry, the underflow was correspondingly lowered, the periods of low water in the river were greatly extended and the bottom lands less moist and less affected by sub-irrigation; that the river-banks are filled in, the carrying capacity of the river is much less, and the damage from floods much greater. From these witnesses alone the case of the complainant has been established, and even at the expense of reprinting we quote from the cross-examination of many of the Colorado witnesses who live in Kansas.

Mr. Norris, of Raymond, had never lived nearer than ten or eleven miles to the Arkansas river until September, 1902, when he moved to Raymond and there bought low land along the river, which when the river is high is too low and wet for cultivation, and because his lands were flooded during the wet years of 1904 and 1905 is the reason why he was a witness for Colorado. He says:

"Claflin is about twelve miles straight north and some east of Ellinwood. Ellinwood is fourteen miles from Claflin and about five miles west from the east line of Barton county. Yes, sir, my knowledge of the Arkansas river in the early years was gathered while I was living there at Claflin. I never lived in the Arkansas valley or upon the Arkansas river until 1902, and I was comparing the early flow of the river with the later flow with what knowledge I have of it, yes, sir." (1587.)

"Probably 300 acres of that is first-bottom land. On those first bottoms I raise brush mostly. Yes, it is too low for good farming land. And that is the reason I am up here, yes, sir. On the second-bottom lands I raise hay, and if it is high enough we crop it. By 'high enough' I mean if the ground is high enough above the sheet-water. Yes, close to the river the underflow depends upon the amount of water in the river. I am not prepared to state exactly how far back, but I have observed it about half a mile. That is the farthest I have ever noticed it. Yes, it depends upon the amount of water in the river. It follows the level of the water in the river. When the river is up the level of the underflow is up so as to correspond with the river, and when the water in the river is down it goes down, yes, sir.

"Of this 1900 acres of land that I own, I probably raise crops, either hay or plowed crops, on 700 acres, and I farm the places myself; that is, it is under my supervision." (1588.)

Mr. Swarens, of Hutchinson, a witness for Colorado, says:

"Yes, sir, my lands are on Cow creek. It runs through them. Cow creek has flooded my lands lately. We had two floods two years in succession." (1618.)

Mr. Welchons, of Hutchinson, a witness for Colorado, says:

"As to whether or not there has been as much water in the river during the last six years as there was during the dry times of an equal number of years in the earlier times, I will say, well, there has been just as much water in the river in the last three years as there was in the earlier years, in the '70's—clear back as far as the '70's. As to including the year 1903 in these three years, I would say, well, I don't remember that just exactly." (1624.)

Mr. Jewell, of Hutchinson, a witness for Colorado, says:

"In some places it is a little lower ground than in others, and some parts of the ground is higher than others, and the depth to water on the highest place is greater, yes, sir. It is about seven feet at the highest, except when it strikes the upland. The lowest place is only about eighteen inches to two feet to water. The water is practically level under my land. That is the way I find it. Yes, sir, and it corresponds with the level of the water in the river, and I know when the river is full, at them low places the water will soak up long before the bank gets full of water. That is the way I find that the water is level underneath. Then after the river has been low or dry for a long time, of course, when the water goes down the underflow sinks a little. That is the reason I said it was from five to seven feet, according to the rise in the river. These same conditions exist everywhere in the Arkansas valley so far as I know. I know nothing about any other place only my own." (1637.)

Mr. Culberson, of Hutchinson, a witness for Colorado, says:

"As to the first time when I heard this underflow spoken of, I could n't say when I heard it first. Most ever since I have been here, I guess. They call it, I think, the underflow, or sub-irrigation, and I mean by that the water that comes out from the river and rises up. I have taken it to mean that. As to when it rises up under my land, I will say whenever the river rises. As to whether it stays up as long as the river stays up, I will answer, I guess it does. Whenever the river begins to go down the water backs out. As to how deep it is to the level of the underflow under the greater portion of my land, I will say when the river is down it is farther to it—four or five feet, probably. I don't know just exactly. The

time that I said I could n't get in to cultivate my corn there was a flood in Cow creek, yes, sir." (1641.)

Mr. Sprankle, of Wichita, a witness for Colorado, says:

"The water on my land is from twelve to fifteen feet below the surface. No, sir, that depth does not always remain the same. As to what changes it, it varies a little with the river. As to an explanation for that, there is a stratum of water underneath the Arkansas valley that we call the underflow. That stratum is affected in some way by the quantity of water in the river. As to how it is affected by the quantity of water in the river, I presume this stratum of underflow is supplied to some extent by the water from the river. Whether it is all formed in that way or not I don't know. As to the effect of a full river upon this underflow, it will cause the water to rise in the well pipes. As to what effect a dry river has upon the underflow, I will answer, it falls to a certain extent." (1644, 1645.)

Mr. Stevens, of Wichita, a witness for Colorado, says:

"No, the water gets higher now than it used to. It overflows more by my place than it used to. Yes, sir, I judge of the fact of it being higher water now by the fact that it overflows my place worse than it used to. Certainly the water gets higher in the river now than formerly. No, the river is not as wide at my place as it used to be. . . . I should say the bridge now is not as long as the bridge was in 1877; how much shorter I don't know. If the testimony shows that it is 300 feet shorter, and the water came to the same height, and the bridge is the same height, then as to whether there would be as great a volume of water passing down the channel in 1904 as in 1877, I will answer, well, I would say not. It could n't possibly be. You could n't press the water in.

"As to the banks having narrowed up along my place since I first knew them, I will say, east of me I think it has narrowed about one-half, that is, on the south side, and the north bank has remained about as it was in 1877. West of that the north bank has filled in and the south bank has remained the same." (1648, 1649.)

Mr. Foster, of Wichita, a witness for Colorado, says:

"As to whether the condition of low water in the river affects the moisture beneath my land, I would say, well, I suppose the water was farther down in the soil. It would be farther away from vegetation. I am satisfied that was a fact. Then if the river should come up and stay up for some time the water would rise under my land, certainly. There is no question about that. And that is what we call the underflow,

yes, sir. As to whether the presence of the underflow affects the productiveness of my land, I will say, as a matter of course I always thought that the corn roots got down to the moisture when the river was high, and when it was low they did n't. Yes, sir, that was my experience; and I have cropped that place from 1870 to 1900, yes, sir. Yes, sir, I stated that it was four or five feet to water on my place sometimes, and it would be nearer than that, of course, when the river was out of its banks. It was out last year all over us, but last year was an extreme year, yes, sir. I could n't say how the underflow was during the '90's as to any particular year. As to it being a fact that the underflow depends on the amount of water in the river and not to any appreciable extent upon the rainfall, I would say yes, sir. As to what extent an ordinary rain—not an extreme one—has upon the underflow, I would say, none at all." (1654.)

Mr. Malone, of Wichita, a witness for Colorado, says:

"I have rented the same farm that I now live on since 1890. This place is seven and a half miles northwest of Wichita, and the river adjoins the farm. Part of it is wet and part of it is dry. I mean, by wet land, land that holds water, where the water don't drain off of it rapidly. Yes, there is an old slough there. It runs down through that place. It is a depression. It has no well-defined banks or anything. There is about two feet of water in that slough now in one place, on this 9th day of May, 1905. That slough is of various widths, probably a rod or two wide, that is, where it is continuously water; and I think the whole length of that slough where the water is now is the whole length of one of the quarter-sections. Where it is two or three rods wide is the widest place. I expect it will average a rod wide where the water is, and clear across the place I am on. Part of the land is sandy. That slough last year was full of water—not the whole of the year 1904. It had water in it in 1904, I should say, from the 10th day of May until the 15th day of July, and at times in the fall after a rise in the river or a heavy rain. I don't know as I would be able to tell which affects the slough most—a heavy rain or a rise in the river. They both affect it. I don't remember as to there being two or three rises in the river in the fall of 1904, but this slough had water in it two or three times in that fall. . . . Yes, sir, the land along this slough and for some distance back was pretty wet last year, so that we did n't farm it at all. It is too uncertain. That slough always has water in it every spring. It is generally dry in the fall. I think it was dry in the fall of 1903. As to how it has been during the last ten years prior to 1903, excepting in flood times of the river, I will say it is just as I tell you: a rise in the river will throw water in there, or a heavy rain, either

one of them; and I might say there is a ditch cut off of the farm land that runs water in there, too. No, there was no water in that slough during times when there is no flood in the river, unless there has been a heavy rain. No, sir, an ordinary rain does not affect that slough very much. A big, heavy rain does, yes, sir. Such a rain as caused the flood at Wichita in 1904 would affect it. On the balance of that land we raise wheat, corn, oats, and potatoes. I don't think that the condition of the river affects the land on the west quarter to any extent at all. I never have any trouble farming the land unless it is flood rains." (1657, 1658.)

Mr. Brown, of Colwich, a witness for Colorado, says:

"Some of it up close to the river I never broke up at all. We thought it more valuable for mowing and grazing purposes. When the river was up the water was very often up on that land—on the grass—and when the river was down there was no water on the land unless from a rain. . . . Yes, sir, the underflow rises and falls according to the condition of the river. Yes, sir, after the river has been up a time the underflow is higher, and after the river has been low for a time the underflow is lower." (1663, 1664.)

Mr. Loshbough, of Wichita, a witness for Colorado, says:

"I bought lots numbered 7, 8, and 9, and these lots lie next to the river. Yes, sir, there is made land along it, and I have more land now than I had before; yes, sir, more than when the government survey was made. I am right in the bend there. I would judge there was probably thirty acres more. That has been made, I suppose, from the river and timber and such things. It was made by the river and the sand from the river, of course. The land was made there by the filling of the river, and these trees grew over it; that is, over a part of it. No, sir, I did n't do anything to increase that made land. . . . Yes, sir, it overflows. I think in the last twelve or thirteen years it has overflowed about four times. I think it overflowed once in August in the '90's and once in May in the '90's, and it is overflowed now (May 9, 1905), and it was overflowed last year. I guess it has overflowed five times. I don't think it overflowed more than once last year. No, there is no slough on my land. The land is not too wet for general cultivation unless it overflows. I cultivate corn down next to the river. I have raised a good crop of corn during the last twelve years pretty nearly always, unless it overflows. The difficulty is my crop drowns out when it overflows. My land extends back from the river at the farthest point about half a mile. Yes, the water-level under my land is different at different times in the year. Of course it is. As to why that is, it is for the same reason that

the river is out of its banks—has been the last few days. Last week it was out of its banks. Then the river was close to the top of the ground, of course. Some of it was on top of the ground, because it ran over. . . . I should say that the lowest that I ever knew the water-level to be was about seven feet below the surface, and at the highest point it would be within two and a half feet of the top—maybe within two feet. As to what caused this variation, I would say it would be the rise of the river, the same as it is now, or heavy rains like it was last year. Either will do it. Yes, when there has been no rain to affect it, the rise and fall of the river does to a certain extent affect the water-level in the well. As to how far back that extends, I don't know exactly. I can say this: when the river is up it will affect my well in about twelve hours, and that is just about eighty rods back from the river. Yes, if the river had been dry and a sudden flow should come, I would probably notice it in my well in about twelve hours. Yes, sir, if the river stays up three weeks it would practically raise the level of the water in this sandy land in places. As to what effect on the water-level under my land there is if the river would be dry for a number of weeks, I will say it is but very little. It don't average over two or three feet. That would be my honest opinion in regard to that level. As to the water-level under my land after the river gets dry, I will say it is bound to go down after the flood decreases. As I say, the rise of the river coming up, in twelve hours it will go back to that well. If the river goes down the water will fall with it. Yes, when the river is up it comes within about two feet of the surface of that well, something like that, and then when the river is down the level of the water in the well is about seven feet, as near as I can tell. Yes, sir, the variation of the level of the underflow at that well is about three to four feet. You see seven to two would be about five feet, yes, sir. As to whether it affects other wells out there in the same way, I would say, all, I think, that are along next to the river are the same as mine. They are all affected alike. . . . When I forded the river in 1872 it was from bank to bank, and I waded it most of the way. As to how wide the river was, it was along under my arms here in places, unless there would be holes where the sand would come up. Yes, it would average something like four or five feet deep. I don't know; I was fifteen or sixteen years old. That was on the 4th of July, 1872. As to how high the water was when exhibit A-1 was taken, as to whether it was high or low water, well, I would n't say it was high water. The water in exhibit A-1 would be just about as the water looked the first time I saw it, as near as I could tell you, when I crossed it, and I would say it was three or four feet deep. That water would be, as shown in exhibit A-1, I should say probably eight or ten feet down from the bridge. Yes, sir, I

was here in Wichita at the time the big flood was here in 1877, and I surely did see the water at the bridge during that flood, and that is the bridge that is shown in exhibit A-1. The water came very near the bridge, and I would n't say it did n't go over the floor, but it came right up to the sills; that is, it touched the cross-pieces right at the bottom where they set on the piles. I believe that any floating material, like a tree or a board, would almost have struck the sills of the bridge. That is my memory." (1667, 1668, 1669, 1673.)

Mr. Tucker, of Wichita, a witness for Colorado, says:

"Examining complainant's exhibit A-41, if that picture was taken last August, these piles appear to show a little in this picture. The probability is that the water was not low enough during the '80's and '90's for these piles to show above the water. If the water had been low enough at any time before the '90's for those piles to show, I think in all probability I might have noticed it. Yes, those pilings were cut off under low-water mark. They used to be entirely out of sight at low water. Yes, they were built under water and under sand. That is my recollection of it. There was three- or four-inch plank laid on top of them and the stone abutments built on the plank. Yes, those planks show in the picture, exhibit A-41." (1677.)

Mr. Schaefer, of Sedgwick, a witness for Colorado, says:

"Yes, I spoke about some land overflowing in the year 1904. I don't think that the Little Arkansas river had as much to do with it as the Emma and Sand creeks, which flow into the Little Arkansas river. Oh, yes, the Little Arkansas river was high in July, 1904. It was high several times. These floods came from heavy rains or cloudbursts. Yes, it was reported that these little streams that run into the Little Arkansas river overflowed their banks at that flood. This overflow swept away 160 acres of my land, everything on it, but left sediment there that I considered repaid me for the loss of my crop. That was from the Little Arkansas river and Emma creek. These floods were caused entirely by local rains, extending ten or twenty or thirty miles away." (1689.)

Mr. Doffiemyre, of Wichita, a witness for Colorado, says:

"The trees on Ackerman's island run from small trees the size of your arm up to perhaps five or six inches in diameter. Perhaps some of them are larger than that. I don't know as to how long these trees have been growing there; I should judge fifteen or sixteen years, perhaps. In the neighborhood of that. I could n't say exactly. Yes, I can remember when there was practically no island there, or when it was a very small affair anyhow.

"Examining exhibit A-1, I will say, yes, sir, I recognize that as the old wooden bridge at Douglas avenue. Yes, sir, that picture shows what there was of Ackerman's island at that time, I guess. Yes, sir, that is a good picture of the river as it was from the time I knew it first down to 1879. Yes, sir, that old wooden bridge was taken down in 1879 and the iron bridge built in the same location.

"Yes, I recognize exhibit A-2, and I can see Ackerman's island, or the beginning of it, there. That picture represents it tolerably fairly. It was a sand-bar then, and it would be entirely covered when the river would be high.

"Examining exhibit A-3, I will say it does n't show Ackerman's island. Yes, when that picture was taken Ackerman's island was below the water. Yes, sir, Ackerman's island has all grown up within the last fifteen or twenty years, so far as the island is concerned, and at low water at that time it appeared simply as a sand-bar. Yes, sir, I think so. . . . Yes, sir, where this hard-pan or gumbo does n't appear in my land, it is affected by the rise and fall of the river. It comes up there and stands in pools. Upon this bottom land it would be useless to put a crop on that. Take it now in this last rise of the river, if I had a crop on that it would be perfectly miry. I could n't cultivate it. There is water standing there that would kill the crops; and that was the condition on a good portion of my land last year. I think last year was the wettest year ever known in Kansas, so far as the flow of the river was concerned. There were more floods coming down the river from the upper reaches of the river, and more rainfall. I think from about the 10th of April to the 10th of July in the neighborhood of thirty inches of water fell. We had some rains where five inches of water fell. Yes, this flood of 1904 was caused largely by local rains." (1693, 1694, 1696.)

Mr. Rush, of Wichita, a witness for Colorado, says:

"The land that I farmed down near the river in the earlier years here is low, bottom land. Some of it was wet and some dry. Some of it was black, heavy land and some of it was light, sandy land, and one place where the river got high it overflowed three or four acres. When the water was there I could do nothing with that kind of land." (1700.)

Mr. Williams, of Wichita, a witness for Colorado, says:

"Yes, sir, my land extends five miles along the river and a mile and three-quarters, at the farthest, back from the river. . . . A good deal of it overflowed last year; I could n't tell how many acres, but quite a little of it. It did n't overflow from the river last year, but the river was out at the time we had the heavy rains, and it was the heavy rains that caused the flood—that is, that made the water on the lands.

It did n't run out of the river, but it did n't let the water into the river off the land. I suppose last year there would be water covering several hundred acres of my land, perhaps a third of it, and it stayed more or less there for some three weeks." (1708.)

Mr. Loughlin, of Wichita, a witness for Colorado, says:

"As to the number of years I have farmed in this valley in which the rainfall has not been sufficient or sufficiently distributed to make corn in itself, I will say, I should judge probably a third of the time, to make a good corn crop. Yes, during that third of the time people would have good corn on land that is subject to and affected by the underflow; that is, they will have better corn than they will on the uplands. Yes, I have in the neighborhood of a hundred acres of land now, made land and all. I mean by the made land that the river-bank has closed in, and I have got some land out of the river. My deed calls for 77.76 acres, and I have about a hundred acres, giving me about twenty-three acres of made land or a little more. . . . Yes, sir, the river is narrowing year by year, and this has been going on for fifteen years anyway. Yes, I remember the condition about twenty years ago; we went swimming in the summer and skating in the winter. In the year 1903 I don't believe there was very much water in the river, and not much of a flow then. . . . Examining complainant's exhibit A-3, it looks a good deal like the Douglas Avenue bridge. Ackerman's island looks as though it had grown clear down to the bridge. Looking at this picture, I don't recognize the place at all. I was never down there in that period of the year that I remember of on the Douglas Avenue bridge." (1719, 1720, 1721.)

Mr. Lumbert, of Wichita, a witness for Colorado, says:

"All I know about it is in these draws where the sloughs are. It goes right through the middle of it. It is only two feet there to water. . . . You take them draws, they will raise nothing anyhow. The water is so cold and the ground is so cold nothing will grow in those draws." (1724, 1725.)

Mr. Belden, of Sedgwick, a witness for Colorado, says:

"Yes, on my land it is too deep to the underflow to have any effect. There might be some places where it would affect it. There are places along the river that are low enough that sometimes when the water is high it seeps out. I think there are perhaps some places, but it is n't fit to cultivate. Very likely the presence of the underflow upon all first-bottom lands would be beneficial to all crops raised on those lands whose roots would reach down into the underflow, and the distance would depend on the kind of crops, certainly; and

the roots of some go deeper than others. I believe that an orchard planted in some of that great Arkansas river land where it could reach moist ground at four or five feet would be benefited by the underflow." (1732.)

Mr. Winters, of Wichita, a witness for Colorado, says:

"Yes, sir, my land is very nearly level, except the forty that I bought last. There is a little swale runs through it. We had it in cultivation, but it is quite low. I should judge that that forty—that I spoke of about two feet above the level of the river—is about two feet above the level of the river when it is at a medium stage, and the eighty acres are about three and a half to four feet above the river at the same stage. So my land runs from two to four feet above the river. Of course, there are some ridges running along next to the river. There is a sand ridge there that would be a little higher than the rest of it. Yes, sir, about twenty acres of my land overflowed at the flood of July, 1904. I don't know how long the high water stayed on my land, but it stayed on there about three weeks, and killed the corn and part of the meadows. . . . Yes, sir, I believe the water was higher in that well at one time than it was at another. As to what caused it to vary, I will say, the river, I think. When the river was high we would have high water there, and when the river was low it was not quite so much. We sank boxes, you know, and we could tell by dipping out the quicksand. That was twenty rods from my house and three-quarters of a mile back from the river. . . . Yes, sir, my land is so located that I can have better crops when the river is low, taking it the year through, than when the river is high, so I have been troubled more during high water than during low water, yes, sir." (1737, 1738.)

Mr. J. W. Sites, of Wichita, a witness for Colorado, says:

"The low land I spoke of occupies perhaps 250 or 300 acres. Yes, sir, the big slough runs diagonally through it. At my place it is about three-quarters of a mile wide, but it don't all run on my land; it extends over onto the other side. The big slough heads up northwest of here somewhere, up above my premises. I think the big slough empties into the big river south of Wichita. In the big slough it is two and a half to three feet to water. . . . An ordinary rain raises the water in it. Most any rain of any consequence will raise the water in the slough, but not a light rain. A heavy rain will fill it full. I don't know how many times that slough was flooded in 1904. It was full last year and remained full quite a while. I could n't say definitely how long. Probably a month or so. I think that was in June, if I am not mistaken, but it was at the time of the big flood here in Wichita. Yes,

that big slough was flooded for three or four weeks, and was quite deep. It would come almost up to the box of the buggy in crossing in places. Of course, it did n't extend all over the ground in the slough that year, but in many places it would come up to the box of the buggy. Yes, I think that slough runs around west of the city of Wichita about two miles or a little more—perhaps three miles. Yes, it is the same one that is known as the big slough west of the city here. I never knew that it got any higher than it did in 1904." (1742, 1743.)

Mr. Dotson, of Wichita, a witness for Colorado, says:

"Yes, the flood of 1904 flooded my land some. It did n't get so very high. Probably the deepest—there is a channel or kind of low place of ground that runs along the river. I expect that—well, it swam a horse in crossing. It would be five or six feet deep, and was eight or ten rods wide. I don't suppose that depth was more than eight or ten rods in width, but then it would get shallower over the land and run back a couple of hundred rods. I should think there was twenty acres overflowed in all. That water stood on it for several days. Whenever the water gets up to the level of the bank of the river it runs over my land. It takes a pretty high flood to do that, yes, sir. My land is flooded right now. I have ten acres of wheat that is under water. . . . Yes, in those places there is always a wide channel and a narrow channel. Yes, I have known such places where the narrow channel has filled up and the island has become attached to the mainland and the narrow channel has just grown up with trees—filled up with sand and cottonwoods and made land, so that the island is practically a part of the mainland; that is true, it adjoins the mainland. I know of two or three such places. There are some of them about half a mile from where I live, but not on my land. . . .

"Examining complainant's exhibit A-52, and as to whether that is a fair representation of the swimming of cattle across the Arkansas river in those early days, I will say that looks something like it. It looks a good deal like it. I never saw as many cattle strung out in a string like that, though. They are most generally in a bunch. I have helped swim 200 across at one time. During those times, as to how I crossed the river, I swam just the same—I swam my horses. We could n't get them on the ferry. I don't remember whether the ferry was running at that time. Right where the bridge is now, I have swum them there, and then a mile south of here I have swum them. I swam them until there was a bridge here. I have swum them right here where this bridge is, after the bridge was built. Yes, at the location of the Douglas Avenue bridge, I have swum them there. I think that was in

1871, and it was in the summer. I could n't count the times that I helped swim them. That is, not so awful many times here. For two or three years we used to swim them instead of crossing the bridge, after the bridge was built, and we swam them for a year or two after the bridge. It was quite a job to get the cattle on the bridge, you know, and we used to swim them instead of crossing the bridge, and then there was some toll to be paid.

"Examining complainant's exhibit A-1, that looks very much like the old wooden bridge at Douglas avenue. I never saw that picture until you handed it to me a minute ago. I have run cattle on the north side of the bridge and swum them down under it, under the first tier, and crossed down and came out on the other side. We started in on the west side of the river and drove them under the first panel or span and let them come through there and swim to the bank across on the east side. We put them in on the north side of the river and took them out on the south side of the bridge, at the east bank. Yes, sir, sometimes we had trouble in getting our cattle under the bridge at that time, for in getting under the bridge it was pretty close sometimes. We would n't have any trouble in getting under the bridge because it was all under water.

"Examining exhibit A-1, I would say it looks very much like it was at the times when I swam those cattle under it. Yes, I recognize it as the bridge and the river at the place I have described. I would think that sometimes when we swam the cattle across there it would be higher and at other times about the same as it is in the picture. . . . If to-day when the river is high you started a herd of cattle in to swim them across the river where I did in 1871, I guess you would run onto Ackerman's island finally, yes, sir; and on that part of the river instead of swimming them they could walk across to-day, yes, sir, part of it."

Mr. A. J. Shore, of Oxford, a witness for Colorado, says:

"Yes, sir, the water-level along the river where the effect of the river is felt will vary five or six feet, according to the stage of the river. Yes, there are clayey substances and places along there where the underflow is not as perceptible as at other places. There is a difference in the soil—some clayey soil and some sandy soil—and the underflow is more perceptible in the sandy soil than the clayey soil. . . . Yes, the extremely high flood that overflowed the land was last July, I think. If there were two floods they came so close together we could hardly see that there were two. I could n't tell how long they lasted; a couple of weeks, perhaps." (1759.)

Of the farm of Mr. Shore, a witness for the complainant says:

"The farm of Mr. A. J. Shore, during the flood of last year the high water was all over it and it was up in his house." (2230.)

Mr. Carson, of Oxford, a witness for Colorado, says:

"My land decreased in this last flood of last year. That was the time it cut so much away. Yes, that flood was an excessive flood and overflowed that thirty acres six feet deep. There were two periods of that flood, and they lasted, I guess, about a week each time, and they were about a month apart. . . . If any witness has testified for the state of Colorado that between 1881 and 1889 the Arkansas river at Oxford was dry two-thirds of the time, I should say he was mistaken. I never saw it dry at Oxford." (1765.)

Mr. Morrill, of Oxford, a witness for Colorado, says:

"The summer of 1904 was the wettest ever known so far as the flow of the river was concerned, but not the whole fall, only in the summer. I think the floods did n't come down as late as September or October. As to the Santa Fe tracks being washed out in September and October in Colorado, if I knew anything about it I have forgotten it. I might have read of it. I don't know anything about the Eden wreck, in Colorado, last year. I might have heard of it. I could n't say whether there was any flood in the river about that time or not. Yes, sir, I had some experience with the flood in July, 1904. I lost all my crops." (1775.)

Mr. Nixon, of Oxford, a witness for Colorado, says:

"Yes, sir, I have seen the pontoon bridge at Oxford, and crossed it many a time. They had the boats cabled up with a cable that ran across, and the water was under the boats. No, sir, I never saw a time when the river was dry at Oxford. I have never seen it dry here since I have been here, and I have been here twenty-three years. Oxford is below the mouth of the Ninnescah, and I never knew the Ninnescah to go dry." (1783.)

Mr. Hamm, of Oxford, a witness for Colorado, says:

"In judging of the volume of the water, as to whether I judge by the height of the water in the river, I will say, I don't know, of course, about that. That might be. I never have much judgment about the water. Of course, I see it sometimes, too. The water is up sometimes and low sometimes. No, sir, I am not affected by the presence of the river

at all at my land. It is thirty-nine feet to water at my place, and that is on the upland. So I have no occasion to observe the condition of the river because of any interest I have in it." (1785.)

Mr. Thompson, of Oxford, a witness for Colorado, says:

"Yes, sir, in judging of the flow of the river I took into consideration these high waters of last year. The land between my land and the river overflows, some of it. Yes, sir, it overflowed last year. The land I handle runs to the river. It has overflowed this spring on some of the low land, or it was overflowed a few days ago. That is from this same flood that is on now. There is a little made land along next to the river." (1789.)

Mr. Buffington, of Oxford, a witness for Colorado, says:

"As to whether the water under that bottom land varies in height about six feet, I would say it varies just as much as the river rises and falls. As to how far back that extends, I will answer, it runs back as far as this first bottom goes, and there are places the river runs plumb to the banks—to the upland. . . . As to whether that bottom land would be as good, taking it year in and year out, with our present rainfall, if the river was low all the time as though the river were at a medium height all the time, I will say it is a matter of opinion, but my owning land as I do, I would like to see the river low all the time, because I don't want it to overflow. We got it heavily last year, and the flood of last year in respect to my crops necessarily would be in my mind all the time. We would naturally think about it. . . . Oh, yes, I did have it in mind. I would have to think about the high water of last year and the high water of 1877; and the water in 1874, the grasshopper year, was the lowest I ever saw it. Oh, no, it did n't go dry at Oxford. The river was never dry." (1792, 1793.)

Mr. Hahn, of Oxford, a witness for Colorado, says:

"During the dry years, if the river remains up, and consequently the water-level under my land remains up, as to whether my crop is better than though the river was dry or low and the water-level was low, I will say, yes, sir. . . . Yes, sir, it ruins a crop if it overflows and the water stays on for a long time, and I have been injured by a flood over there within the last year, yes, sir, and on all of my bottom lands." (1799.)

Mr. Pennington, of Oxford, a witness for Colorado, says:

"'Yes, sir, this 140 acres of land I spoke of practically all overflowed last year, except the sand-hills." (1801.)

Mr. Price, of Winfield, a witness for Colorado, says:

"I never saw the Ninnescah go dry. I never knew the Arkansas river to go dry at Oxford. I have seen it pretty low. It was pretty low, I believe, in 1903. It was low in 1902. I don't—about 1901. I think 1901 was one of the dryest years." (1805.)

We have thus quoted extensively from the testimony adduced by the defendants and gathered in Kansas, and we submit that from it alone the complainant has made out its case. This testimony does not contradict the testimony of the complainant, but upon all substantial points in issue supports and proves the complainant's case. In securing these witnesses the defendants did their worst; they exerted themselves to the utmost. We have quoted the evidence fully and not in detached sentences, but all the weight that it carries is found on the Kansas side of the balance.

SECTION 7. River-bed, Ditches, Rainfall, Crops, Revenues.

THE DIMINISHED RIVER-BED.

The counsel who prepared the brief for Colorado has written something of an argument concerning the narrowing of the river in Kansas, and hearing none of the testimony, and never having seen the Arkansas river in Kansas in the early years, has tried to convince himself that the river has not changed nor narrowed since the water was diverted in Colorado. His theory is that there is no color because the blind man does not see, and there is no sound because the deaf man cannot hear. But scores of witnesses testified that within the last fifteen or twenty years the width of the river has been diminished one-third or one-half between Wichita and Dodge City, that the bed has filled up with islands and the islands have grown over with trees, and that the bridges have been shortened because parts of them had become useless. Complainant's exhibits 1, 2, 3, 60 and 61 show these changes and the narrowing of the river no less than the actual measurements set out on page 48 of our former brief. The witnesses introduced at Topeka all testified that no narrowing whatever

had taken place along the Smoky Hill, Solomon, Saline or Kansas rivers, and no islands had formed in their beds. Exhibits 55, 56, 57, 58 and 59 show the island condition at Hutchinson, while 60 and 61 show this condition half-way between Hutchinson and Wichita. Ackerman's island has grown old in this argument as well as large in the river, and yet it had no existence as an island when exhibit No. 3 was taken, after June, 1889. The bridge at Great Bend shows this condition the same as the bridges at Kinsley, Hutchinson, Wichita, and other places. The made land amounts to thousands of acres. This land could not have been made except by the narrowing and filling up of the river-bed. The banks could not have narrowed if the original amount of water had been there to keep the banks back. This visible change, seen everywhere between Wichita and Dodge, and known by every one who knew the condition before and knows it now, being confined to the Arkansas river in Kansas, and all having been wrought within the last twenty years at the utmost, cannot be disputed, denied nor minimized by one or more who have not noticed this nor other marked and notable changes. A few men may be found in every community whose observations are so dull and limited that common objects make no registration upon their impressionless visions. Some were so deaf to Noah's warning that they did not notice the coming of the flood until their own buildings were afloat. The diligence of counsel for Colorado was rewarded by finding a half-dozen persons in Kansas whose observations of natural objects around them were sufficiently dead to suit the convenience and purposes of counsel; men to whom natural events and natural conditions never appeal, and into whose mental composition natural events and conditions never enter. This may be excused in these few unobserving individuals who were searched out and found by counsel for Colorado on the ground that the changes in the Arkansas river came gradually; they were not wrought in one day nor in one year, nor were they completed in any five years. These changes began

gradually, with the gradual diversion of the water in the river, and have gradually increased as these diversions have been and become more complete and effective. The results naturally followed the cause, and while counsel fully admit the cause, their denial of the necessary and inevitable consequences avails nothing. That an unobservant and uninterested few saw nothing is no disproof of the existence of a daily and increasing fact. Having had no condition in mind as to how the river ran twenty-five years ago, these few had no standard of comparison and no basis of a judgment. Facts are not established or disproved by such opinions.

THE KANSAS DITCHES.

It is a somewhat bold and audacious statement of counsel for Colorado that the western Kansas ditches have not suffered by reason of irrigation in Colorado. After all the evidence of the witnesses quoted in our former brief upon this point, if there had been no suffering on the part of the Kansas ditches, it is strange that Professor Johnson should have recorded such a solemn travesty as is found in his article quoted on page 155 of our former brief, and requoted on page 58 herein. If the Kansas ditches had not suffered, Professor Mead must have been drawing upon his imagination when he wrote the following in his Irrigation Institutions, and referred to by him on page 1397 of the evidence:

"As water is now used, about two-thirds of all that is diverted by ditches and canals is taken up by growing crops or absorbed by the air through evaporation. Approximately one-third of the volume diverted returns to the natural channel through waste and seepage. In the future, because of better canals and more skilful irrigators, even less will return. Many streams will in time, therefore, become mere remnants of their former selves. This change in a few instances has already taken place. So little water runs in some of the rivers of southern California that the stream channels are now grown up with underbrush. Reservoirs catch the floods and ditches divert the ordinary flow. It is claimed that the diversion of water in Colorado is causing the bed of the Arkansas in Kansas to be filled with drifting sand. To water many Western valleys will involve drying up the streams which flow through them, and this physical fact ought to be

faced frankly and honestly. The doctrine of appropriation contemplates using all the water, and if it is to be carried to its logical end, the rights of riparian proprietors on many streams must be encroached upon."

Again, on page 339, Professor Mead says:

"Speaking without reference to the issue before the court, the following facts regarding the changes in the flow of streams wrought by settlement seem to be well established: Its effect on the water-supply of the whole country has been injurious. It has widened the limits between floods and drought; the fluctuation between high and low water has become greater than it was formerly, not alone in the mountain states, but in the Mississippi valley as well."

Again, on page 342 he says:

"If the irrigated valley is long enough, and the irrigated district broad enough, the ultimate absorption of the water-supply is inevitable."

If the Kansas ditches had not suffered, it is a queer statement found in the Report of the Kansas Board of Irrigation Survey and Experiment for 1895 and 1896, where it is said, as shown on page 1857 of the evidence:

"The Arkansas and Cimarron rivers would furnish a less amount of water than any of the others; a very large portion of the former's water is taken out in Colorado, and this will be increased in the future, it may be to the entire amount at the state line, except the large floods. . . . Since 1892 the surface flow of the Arkansas river has gradually failed, until in the year 1896 there was scarcely any flow east of the Colorado line; not because there was any diminution in the water-supply at the sources of the river, but on account of the increase in the number and carrying capacity of these ditches constructed in Colorado, which absorbed all the waters, and thereby left Kansas ditches unsupplied."

If the Kansas ditches had not suffered, Mr. Wm. E. Smythe, the author of The Conquest of Arid America, should be informed of this fact, so he may no longer mislead the public, for on pages 110 and 111 of his revised edition of 1905 he says:

"Kansas is the mother of irrigation on the plains. When the people heard of the miracle wrought by the waters of the abandoned mill-race their optimism instantly foretold a better

civilization than they had dreamed of. Irrigation began here with canal building in the valley of the Arkansas river. For a time the work was prosecuted with remarkable vigor. As early as 1890 over 400 miles of large canals had been built, at a cost of nearly three million dollars. But the industry came suddenly face to face with an unexpected and almost fatal obstacle.

"The Arkansas river rises in the mountains of Colorado and waters a broad and fertile valley before crossing the boundary into Kansas. In the upper state enterprise was busy with the diversion of its waters. In the absence of any regulation of interstate streams by national authority, the Colorado irrigators claimed the right to take the last drop of water for their own canals. This they proceeded to do during the growing season, leaving the canals of western Kansas as dry as its prairies. The investment of an English company in extensive works costing more than a million dollars was practically destroyed by this turn of affairs. There were many similar losses of less magnitude."

If these Kansas ditches have not suffered, the stockholders who invested in the Kansas ditches in the '80's should be informed of the fact that the water they enjoyed for a number of years has really been in their ditches all the time, and that they were troubled with imperfect vision, and really have been locoed in supposing their ditches to have been dry during at least the last fifteen years. Such simple facts should not remain so misunderstood, and the witnesses should correct their testimony; investigators and authors should correct their statements; the United States Geological Survey should correct its conclusions, and the investors should correct their losses.

THE ANNUAL RAINFALL.

Counsel for Colorado think they have discovered a mare's nest in the rainfall figures at Dodge City, and on page 202 pretend to deal out certain instruction therefrom, using only such parts of the figures as suit their proposed calculations. In making their calculations counsel have followed a system

which Macaulay calls "packing." The records at Dodge City for the last thirty-one years show the following:

ANNUAL RAINFALL AT DODGE CITY.

In 1875	10.69 inches.	In 1891	32.34 inches.
1876	15.40 "	1892	19.66 "
1877	27.89 "	1893	10.12 "
1878	17.96 "	1894	12.60 "
1879	15.43 "	1895	20.31 "
1880	18.12 "	1896	19.87 "
1881	33 55 "	1897	21.58 "
1882	13.14 "	1898	31.46 "
1883	28.56 "	1899	28.45 "
1884	30.36 "	1900	20.76 "
1885	23.71 "	1901	16.06 "
1886	19.35 "	1902	17.70 "
1887	15 71 "	1903	15.27 "
1888	22 94 "	1904	17.19 "
1889	19 17 "	1905	25.96 "
1890	11.72 "		

Average rainfall for 16 years—		1875 to 1890,	20.85 inches.
" " 15 "		1891 to 1905,	20.62 "
" " 6 "		1882 to 1887,	21.79 "
" " 5 "		1888 to 1892,	21.17 "
" " 5 "		1895 to 1900,	23.17 "

For some reason counsel have omitted from the table found on page 202 of their brief the dry years during the first half of this period, and have omitted the wet years during the second half of the period. With such omissions, figures can be made to prove anything. During the five years from 1887 to 1891 the appropriations made by the ditch companies in Colorado are as follows, as shown on page 123 of our former brief:

In 1887	1481.10	cubic feet	per second.
In 1889	199.47	"	"
In 1890	1705.66	"	"
In 1891	61.00	"	"

In from one to two years after the date of the decree the water was turned into the ditch (505). As shown above, during the six years from 1882 to 1887, when the Garden City ditches had plenty of water, the average rainfall was 21.79

inches. During the next five years, from 1888 to 1892, when the above appropriations were made in Colorado of 3447.23 cubic feet per second, the average annual rainfall was 21.17 inches. During the five years from 1895 to 1900, when the ditches in Colorado were taking all the water and the river was dry much of the time in Kansas, the average rainfall was 23.17 inches. It is true that during 1893 and 1894 the rainfall was less than normal, but the river in Kansas was no dryer than during the years when the rainfall was above normal. Why counsel should omit the wet years in one part of their computation and the dry years in another part is for them to explain. These records of the rainfall were kept at Dodge City, 120 miles east of the state line. Even at Dodge City an ordinary rainfall has but little influence upon the flow of the river, and above that place it has even less effect. The geography of this region, the topography, the hydrography, the meterology and the flow of the river have all been common knowledge from 1875 to the present time, and the facts of the depletion of the river in Colorado and its loss in Kansas cannot be obscured by any transparent though clever manipulation of figures. The river was absolutely dry at Garden City from July 25, 1903, to May 3, 1904 (575), and yet the ditches in Colorado were all that time enhancing the value of their property.

A mere theory will not obliterate the facts sworn to by all the witnesses and open to the observation of any one who travels from Wichita to Coolidge, even by railroad, in the daytime.

THE SUMMER FLOW.

Counsel pretend to argue that the appropriation of the water of the Arkansas river in Colorado increased the summer flow through Kansas and furnishes more water for the Kansas ditches. Again, this is a theory developed by their claim that if they should store the surplus water in the spring in reservoirs and then turn it lose in the summer season the flow be-

low would be increased. But this is just what they do not do. They do not impound the surplus waters in the spring, and they do not release them in the summer season. What they do take in the spring is used to supply more extensive ditches in Colorado further back from the river, on arid land, and its seepage is captured and used by the next ditch below, still in Colorado. The testimony of Mr. Chew on this point is quoted on pages 129-131 of our former brief, and of Mr. Wiley, on pages 127 and 128. On page 121 of that brief we referred to Mr. Cressey's testimony on this point, and which we have quoted in full on page 64.

Instead of inuring to the benefit of Kansas, the whole flow of the river is used again and again in Colorado, leaving Kansas dry below.

THE ARKANSAS CITY WATER POWER.

Counsel again argue that their depletion of the river in Colorado has not affected the power canal at Arkansas City. Prior to this depletion the power canal at Arkansas City had the full benefit of all the water that passed Wichita and of all the tributaries below Wichita and above the intake of the canal. Since the depletion the supply for the canal is limited to these tributaries alone, and the result as described by the witnesses at Arkansas City stands unimpeached. This evidence was referred to in detail in section 13 of our former brief.

NAVIGABILITY.

Counsel have also argued that their depletion of the river in Colorado has not affected the navigability of the river below. This same defense was set up in the case of the United States v. The Rio Grande Dam and Irrigation Co., 174 U. S. 690. That the river is not navigable now anywhere in Kansas, or anywhere above Fort Gibson, in Oklahoma, may be true. How it was in the early years is best shown by the report of Mr. J. D. McKown, the United States engineer, who made his report on January 27, 1879, and which

is found on pages 1852-1854 of the record. The upper point of navigability is now about 200 miles further down the river than when Mr. McKown made his investigations, and when Congress, in 1879, 1880, 1881, and 1882, appropriated $94,000 for its improvement. The emotions of counsel should be restrained for some humorous subject.

Mr. Richard Olney, when secretary of state, in his direction to Col. Anson Mills, U. S. A., concerning the Rio Grande, found on page 347 of volume 2 of the Report of the International Boundary Commission, says:

"The department is aware that the river is not navigable for large craft in the part under consideration, but if the stream in its natural condition be capable of use at certain periods of the year in transporting commercial products by boat or raft, it is a navigable water of the United States and subject to the laws which Congress has enacted or may enact for the regulation and protection of interstate and foreign commerce."

This former condition of the Arkansas river was a valuable asset of the state of Kansas, and any material interference is a substantial injury.

THE REVENUES OF KANSAS.

Counsel further argue that the revenues of Kansas have not been diminished because, since the waters of the river have been appropriated in Colorado and dried up in Kansas, the acreage of wheat in a number of the counties through which the river flows in Kansas has been largely increased. Again the imperfection and limitation of counsel's knowledge concerning the conditions in Kansas have led them astray. The wheat lands of these counties are the uplands, while the bottom lands are used almost exclusively for corn, oats, alfalfa, and like crops. Edwards county is a fair example of this. In this county the acreage of the four leading crops—alfalfa, wheat, corn, and oats—from 1886 to 1904, is found on page 440 of the record. In 1887 the population was 4717, and the assessed valuation $1,459,511, and in 1904 the population was 5286, and the assessed valuation was $1,756,218.

The crop records set out on page 440 show the average, as follows:

Wheat.....	1886 to 1895, 10 yrs., 10,763;	1896 to 1904, 9 yrs., 65,862
Corn	1886 to 1895, 10 yrs., 18,389;	1896 to 1904, 9 yrs., 21,484
Oats.....	1886 to 1895, 10 yrs., 6,479;	1896 to 1904, 9 yrs., 6,094
Alfalfa	1892 to 1898, 7 yrs., 2,701;	1889 to 1904, 6 yrs., 2,264

Alfalfa raising reached its height in 1898, when the county had 6923 acres, and has gradually decreased until 1904, with only 1777, a loss of 5146 acres. During these nineteen years the county has settled up; the population has increased; the wheat on the uplands away from the river has increased from 7338 acres in 1886 to 130,165 acres in 1904; corn has a little more than held its own, with 21,254 acres in 1886 to 23,396 acres in 1904; while oats has fallen from 5559 acres in 1886 to 5311 acres in 1904, and alfalfa to almost nothing, as shown above. If counsel had remembered that wheat is raised on the uplands, and corn, oats and alfalfa on the bottom lands, they would have known the cause of diminution in acreage and consequent loss of revenues. Upon this point Mr. Edwards, of Kinsley, says:

"I think the conditions I have described as to my own alfalfa lands are true of others through this county. I don't believe I am averaging more than a ton of alfalfa to the acre during the year. I make two or three cuttings a year. That is about one-half of a similar crop that I raised years ago. I think I have about 600 or 700 acres in alfalfa now. I think this falling-off has affected the balance of the crop as well as mine. Our alfalfa, or practically all of it, is on the bottom lands." (433.)

Mr. Wellman, of Kinsley, says:

"I am familiar with the crops grown on the bottom lands. We used to get about a ton of prairie hay to the acre in those early days. Now it will run 800 to 1000 pounds, generally speaking, on the bottom. I have had considerable experience with alfalfa, and it is not nearly as thrifty as it used to be. The production of alfalfa on the bottoms now I would n't want to put over one-half as good as it was thirteen or fourteen years ago." (436.)

Mr. Vernon, of Larned, says:

"I have been in the real-estate business somewhat, as well

as in the practice of law. During the first ten or fifteen years after I came here, where the bottom lands and uplands were equally distant from the city in location, I would say that the bottom land was probably worth in the neighborhood of three times the value of the upland. During the last five or ten years I should say there was no practical difference, if the lands were located equally distant from the market. I attribute this comparative change in the relative values now to the fact that the continued productiveness of the bottom lands had been disappointing and the productiveness of the uplands had been greater than was anticipated, and to the fact that the uplands are much better for wheat." (443.)

The depletion of the river in Colorado has a more disastrous effect in Kansas during the dry years, of course, and the figures from Edwards county are instructive upon this point also. When the corn lands began to dry out the farmers resorted to the deeper-rooted alfalfa, and that in turn failed; the bottom lands became less productive and then cheaper uplands were used for wheat, which is a less remunerative crop. Although the defendants are to be charged with loss of crops on the bottom lands, still they are not to be credited with the increase of crops on the uplands. The depletion of the river caused the one, but their irrigation did not cause the other. The defendants are to be charged with the decreased revenue to the state from the loss in value and production of bottom lands, but are not to be credited with the increased revenue from more valuable uplands. If B. is sued for injury to A.'s horse, he cannot plead that now A. has more neat cattle. A demurrer would be sustained to such an answer, and counsel's comment upon our former argument is unworthy of them, and if they had known the facts from Edwards county, they would have known what our reply would be. The illustration from Edwards county is not remarkable, as counsel assert. It is no more remarkable than the facts and figures from Finney county. The losses in these counties were fully described and accounted for by the witnesses, and are neither removed nor extenuated by the attempted argument of counsel.

This part of their brief has the same basis as other parts

of their brief, and, when the facts are understood or taken into consideration, is no more satisfactory nor convincing. The weakness of their argument is easily accounted for; the facts are against them. As long as they retain the goods in their possession, it is idle to argue against the loss to the original owner.

SECTION 8. Colorado's Enhanced Property.

As one of the defenses to our bill of complaint, counsel for Colorado argue that the diversion of the flow of the river and its complete appropriation, so that none of it comes into Kansas, has greatly increased property values within the state of Colorado. They recite at length the amount of land irrigated, the industries dependent thereon which have grown up entirely since this diversion, and the use they have made of this diverted water. We are not called upon to deny these facts, but we deny that they are relevant to the issues involved, and we appeal to this court to say if they constitute a defense to the wrongs against Kansas. The larcener might as well plead that he has made valuable use of the stolen horse, or the embezzler contend that he has founded a college with the usufruct of his crime. It is a monstrous doctrine that the defendants should be permitted to retain continuous possession and use of our property because they have made productive use of it since its abstraction. We submit that all the briefs filed in this court, and indeed the legal arguments of the world, may be examined without finding a parallel to this contention. Its conception is without precedent and its conclusion hitherto undreamed of.

Some of the greatest trials in history have been to stay the hands of the despoilers of empires. Philip despoiled the territory of Greece, and his defenders were driven into banishment. A Roman governor ravished the homes and the temples of Sicily, and after a memorable trial went into exile. A British governor-general despoiled India, and he has endured the odium of the civilized world for a century. In its

early history the territory of Kansas was invaded by the slaveholder and bushwhacker from the east, towns and villages were destroyed and property swept away, but they never justified the invasion and destruction by any form of law. From the west, however, there has been a more insidious and destructive invasion of our rights by the irrigation appropriators of Colorado, who take and hold, and justify the taking and holding, first, because of their created needs; and, second, they have made valuable use of the abstraction. When the Helvetians descended upon the lowlands of Switzerland and attempted to seize the fertile plains of Cisalpine Gaul, they justified it to Cæsar on the same ground now set out in the brief of counsel, but in that case the justification was overruled by the sword. For twenty years Colorado had maintained a continuing trespass against the state of Kansas and its citizens, and now points to the fruits of that trespass as a reason for its indefinite and protected continuance. What Colorado has done to Kansas it has done to Nebraska, Wyoming, and New Mexico. If any mistake was made in the litigation between the United States and the Rio Grande Dam and Irrigation Company, it was in not making the state of Colorado the defendant for depleting the river in the San Luis valley, rather than one ditch company for proposing to impound the little that was left. Absence of express malice cannot justify the acts of the defendants, nor can profitable investment be plead as against the taking and carrying away of the goods of another; neither can the extent of the investment nor the amount of the returns be a defense to the original act, and the greater the profit the greater the wrong. Counsel for Colorado ignore their injuries to other states and territories, and point to the extent of their wrong done to Kansas as a defense for its continuance. In effect, they say that their spoilation is so extensive that it cannot now be checked or restrained. They now plead their numbers and their dollars as against prior vested rights. Their position is as abhorrent to law and justice, and destructive to all those

vested rights which courts are bound to protect, as it is audacious in conception, ingenious in application, and outrageous in execution. The measure of their prosperity is the measure of our loss, and to plead that measure as a justification for the devastation they have wrought in Kansas is certainly without a parallel in litigation.

Apparently counsel contend that the greater the wrong the greater the justification, and the greater our loss the less right we have to recover it. A comparison of land values between the irrigable portions of Colorado and Kansas displays in startling colors the effect of this spoliation. When Colorado entered upon the course we now complain of, Kansas had seven irrigation ditches, and its irrigable lands were being rapidly settled, and we should have achieved all that prosperity which we have lost and Colorado has gained. The hand of the appropriator in Colorado has arrested the growth of Kansas and transferred its increment bodily to Colorado. Every one of the industries and all the prosperity which counsel have so carefully enumerated are founded upon wrong, based upon the denial of the legal right in Kansas, and we appeal to this court that no possession, however long continued, can be based upon such a wrong, and no prosperity, however extensive, can be plead as a defense against the devastation wrought within our borders.

Counsel in the glow of their possessions, which extend over about 313 square miles, and in enumerating the advantages Colorado has obtained by the wrongs complained of, utterly ignore the 2500 square miles of territory in Kansas affected by the loss of the natural flow of the river. What it was has been shown, what it would be now can be inferred from Colorado's brief on the subject of Colorado's prosperity. This part of their defense is that the defendants have taken so much that it would bankrupt them to return the property to its original owner. This we do not concede. On the contrary, we believe that all the testimony taken together will show that if Colorado's irrigators were compelled to do justice,

impound the flood-waters, and use only such portion of the flow of the river as they are entitled to, and use that economically, wasting none, returning all surplus to the river, no harm would be done to the defendants by any decree in this case. It is the arrogant assertion of monopoly, the dominant right which they claim from geography alone, against which we contend and of which we complain. The division engineer at Pueblo, a state officer of Colorado, testified in regard to distributing the water of the river to the Colorado ditches, and quoted on pages 129 and 131 of our former brief:

"In order to give them all I could I took all the water from the river that I could possibly get, and I did n't allow a bit of it to get away if I could help it. We had special orders not to allow any to go down the channel into Kansas. These special orders originated with me." (516.) "We would get hold of it if we could." "During the dry season of the year there would n't be any water down there at all." (499, 500.)

It was conclusively shown that the intention as well as the practice of Colorado was to take every drop of the water, whether it was needed or not, and in some instances the surplus was turned loose upon the upland prairie without any return flow to the river at all (607). When they had produced what Mr. Johnson calls "the finest display of dry ditches in the arid lands," by appropriating 3447.23 cubic feet per second in five years, still there was no disposition to relent or to divide, but they only continued their monopoly. Against this monopoly we protest, and look with abhorrence upon their contention that might makes right and amount establishes title. We deny that a narrow, limited and intensive agriculture is more beneficial than a wide, unlimited and extensive agriculture. We deny that the intensive use of water by the few in Colorado is more beneficial than its extensive use by the many in Kansas. It is more profitable to the country at large to have a great area tilled by an extensive population than a small area intensively tilled by a limited population. We do not antagonize irrigation in Colorado nor anywhere else, and only protest when their subsequent monopoly has

injured our prior rights. The argument of counsel is as unsound in economics as it is contrary to law and justice. It cannot be supported from any standpoint. The two systems ought to stand together, and the new and limited should not destroy the old and unlimited. With a proper construction of law, and with a proper use of water, the prosperity of both domains can be enhanced without injury to either.

SECTION 9. Rights in the Underflow.

In sections XII and XIII of their brief counsel for the state of Colorado seem still to be skeptical about the underflow in the Arkansas valley, and the consequent injury produced by its having been lowered. With one thing they say we can heartily agree. "It is the Arkansas river, as a specific stream, with the character which has been impressed upon it through the centuries, that is to be considered." We may be permitted to add: "For this relief much thanks." The Arkansas river has been impressed through the centuries with an underflow on each side extending back to the uplands, with a definite and positive current moving in a particular direction and with an ascertained velocity. During the observations of Professor Slichter at the flood of August 7, 1904, this current changed direction and away from the river forty-three degrees, as shown on page 91 of our former brief. Professor Slichter also says, as quoted on page 90 of our former brief: "The wave is transmitted with a fairly high velocity, similar to the observations we frequently make where a tide in the ocean affects a well a considerable distance from it, with a lag of only a few hours." (1342.) If the experts had not confined their observations to the Garden City region, and if they had made observations both before and after the diversion of the water in Colorado, "the character which has been impressed upon it through the centuries" would have been more fully presented. Still, upon one point Mr. Johnson is clear:

"The new boom and the erection of the large buildings in Garden City were the results of the digging of the ditches

there. I have stated in my examination and also in my article referred to that these ditches are now a series of dry ditches, and that they went dry because the normal flow of the streams was depleted farther westward in Colorado by the taking out of larger ditches and more of them. Oh, in my opinion, beyond question the Garden City ditches have been dried up by the taking out of the water for the purposes of irrigation in Colorado." (1233.)

As to the lake formerly at Garden City he says:

"It is a perennial lake which has no visible source of supply. It has a ground-water supply. I measured the fluctuations of that lake, too. The water in that lake we are speaking of was slightly higher than in the sandy river-bed, but the lake was nevertheless in the flood-plane of the river. That lake dates back beyond recent years; it might have been there several hundred years. If that lake has entirely sunken away within the last few years, I could account for it as a guess. I would n't want to publish it. I guess that the ground-water plane over a very large region had subsided and that this subsided in correspondence with it; that it was the expression of a regional effect. If that lake between Garden City and the river was large enough thirty years ago to have fished in it and was large enough for a comfortable swimming-pond for the men, and was used for that, and large enough for an outlet to run across the main street, with water enough in it to have ice-houses built upon it, and during the last five years that lake has entirely disappeared and the ground grassed over, with the exception of one very small place not larger than this room—as to the cause of this, I would make a guess there, too. As I think about it, I would guess that the irrigation in the Arkansas valley to the westward has had a marked effect and possibly in part explains that disappearance." (1234.)

Again, Mr. Johnson says:

"In my replies to these half-dozen questions we seem to be speaking of the flood-plane as at Garden City, where it is very narrow and an insignificant thing, and then away out east of Dodge City, where it is a very important thing, and the qualifications to the general statement I made a while ago that the flood-plane wells do oscillate with the river applies where the flood-plane is broad, and when in this last question you ask me in regard to that broad flood-plane, miles in width, and the wells on it away east of Dodge City on those plains, if you ask me whether the rise and fall in those wells is in response to the rise and fall of the river, I say, of course—I suppose—just as I say there is no doubt it is on that little ribbon belt of flood-plane at Garden City. But you see the

flood-plane from there widens and opens eastward until the flood-plane becomes a very important thing far eastward. At Garden City it is insignificant. All that is of value in my testimony relates to the valley in the neighborhood of Garden City and westward, about Lakin, which I was calling the state boundary line, and there I was pretty sure of my facts, that the ground-water slopes toward the river and that only on the little bottom land where the well-water is about at the river level, only a few inches above it, can the effects of floods be felt; but when you get east of there the effects of floods are very important. . . . I took the rate of motion of the ground-water at the surface of the ground-water, at the water-plane—that is, two or three feet below—and at ten feet below, and twenty-five feet below. I think those are my depths. And it all had motion eastward, a little south of east and pretty nearly across the river—but slightly across the course of the river. I had those wells there for a long time, and measured about three months twice a day, and it was the same all the time." (1240, 1241.)

Mr. Newell says:

"I am acquainted with the Garden City ditches, and have been over many of them. It is my general impression that they were taken out from about 1879 to 1883. As to the effect of the taking of waters in Colorado from the Arkansas river since 1884 upon the water-supply that before that time had been applied to irrigation in the Garden City district, I will say that in my opinion the diversion of the water above has unquestionably reduced the amount which those ditches might have received. . . . I was first in western Kansas in 1882, and I think our first actual measurements there were a few about 1890 that were desultory, and the systematic measurements were made at the time Mr. Willard B. Johnson went in, about 1896 and 1897. These investigations I assume were all made quite a while subsequently to the appropriation of the water in the Arkansas river in Colorado. My opinion would be that the effect of these appropriations in Colorado has been progressive rather; that the early construction did not bring under irrigation as much land as is now irrigated. If the evidence in this case shows that the practice of appropriation on the Arkansas river in Colorado was begun about 1885 and was continued down to about 1892, increasing as those years progressed, then I would say that the examination that Mr. Johnson made was after that, and that much of that effect had been produced in the valley below before he made his examinations. . . . If the waters of the Smoky Hill and Solomon rivers have not decreased and the depth to which they have had to go to water in those valleys has not increased in the state of Kansas, and the depth to which they now have to

go in the Arkansas valley in order to find water has increased, I would say that, if that is a fact, then there must have been something different on the Arkansas river than on the Smoky Hill and Solomon rivers. . . . If the principal part of the flow of that river during the last ten or twelve years has been withdrawn, yes, sir, it would take just that much from the supply of the underflow. The regular flow of the river would tend to reenforce the underflow or ground-waters in that immediate vicinity of the river. . . . It is presumable there will be less water in the river as irrigation is developed more completely in Colorado, and I assume that that is true with the ditches in Colorado from Pueblo to the state line as they are, yes, sir. The more completely the water is utilized by the use and reuse in the ditches in Colorado, probably the less amount will escape into Kansas. I understand it is the object of the present system of ditches in Colorado, and that they are so located, to intercept the flow of the seepage. I assume that practically all of the seepage water that goes down into the Arkansas river in Kansas or that goes to reenforce the flow of the Arkansas river is the seepage water from the eastern or last ditch down the river." (1274, 1275, 1276, 1277, 1278.)

Connecting this testimony with the testimony set out in section 10 of our former brief, it is clearly seen that the underflow is not merely percolating water, but is a subterranean stream depending upon the flow of the river, and, when read in connection with the facts set out in section 16 of our former brief, an extensive and continuing damage is shown, and an injury that can be redressed at law.

While insisting that the underflow of the Arkansas river in Kansas is a true underground stream with well-defined banks and a flow parallel to the river, we still contend that such a finding of fact is not necessary to our success in this case. We contend that by whatever definition this real body of water may be known or designated, whether as an underflow appurtenant to the river, sheet-water, ground-water, percolating water, or any old water, the evidence conclusively shows that its presence and relation to the surface soil of the bottom is of vast importance and incalculable benefit to the riparian lands along the Arkansas river in Kansas. That this water has existed for ages is well settled; that from the

earliest historical times its level was constant and its effect upon the riparian lands uniform is well settled by the evidence. Even the witnesses for the defendant admitted this level and its effect until Colorado began to divert and destroy its source of supply.

Conceding that it is merely percolating or ground-water, from whence is it derived? The brief of Colorado, at page 129, in attempting to sustain the sieve theory, shows certain observations taken during the week beginning May 3 and ending May 10, 1904. The table shows that during that week, on May 3, there was a flow in the river at Coolidge, Kan., of 10,000 second-feet. On May 6, three days later, the flow at Kinsley, Kan., was 1800 second-feet, a diminution of 8200 second-feet. This enormous volume of water, amounting to 8200 second-feet, had disappeared somewhere between Coolidge and Kinsley. Counsel for Colorado account for this disappearance by their sieve theory. If their theory be correct, 8200 second-feet of water had vanished into the underflow betwen Coolidge and Kinsley. For ages flood-waters formed by the rainfall and the melting snow in the great drainage area of the Arkansas river on the eastern slope of the Rocky Mountains has gone to feed this same underflow. This underflow has fructified 2500 square miles of land in Kansas. Whenever and to whatever extent the flow of the surface river which feeds this underflow has been interrupted, at that time and to that extent the underflow upon which the fruitfulness of this vast area depends has been depleted, its level lowered, crops dependent upon it diminished or destroyed.

Referring again to pages 218, 219 and 220 of our first brief, we assert that, even though this underflow be treated, considered or defined as ground-water, or percolating water, the damage to Kansas by its lowering and depletion is no less real, no less capable of ascertainment, no less a wrong for which a remedy may be found, than if it were a true subterranean river. Unless a hundred witnesses upon the part of

Kansas have lied, it was upon this underflow and this nearness to the surface that fertility along the Arkansas river in Kansas depended. Whenever this underflow or percolating water was lowered, the fertility of the bottom lands in Kansas was diminished. While it may be true that Colorado could pump this underflow to the surface of lands truly affected by its presence, under the authority of the cases cited in our former brief, it cannot be said that this underflow, its source and supply may be depleted, diminished or destroyed in order to make merchandise of the water in Colorado. It might be a defense to this branch of our contention that Colorado only uses the flow of the river which feeds the underflow for lands to which the river or its underflow is appurtenant, but certainly under no authority can it be maintained that waters that feed this underflow and maintain the fertility of these underflow lands in Kansas can be diverted, made a piece of merchandise, and sold to non-riparian owners, to be used on lands far distant not only from the river itself but from any underflow.

There is no proof that there is any underflow in Colorado. The first sign of underflow or saturation shown by any evidence in this case is eastward from the western border of Kansas. From there on its presence, effect and fertilizing influence are testified to by every witness who has any knowledge upon the subject, expert or non-expert, transient or resident, from Coolidge to Arkansas City. That is a peculiarity that distinguishes the Arkansas river in Kansas from the Arkansas river in Colorado. To this distinction and its effect we invite the court's particular attention.

While still insisting upon this subterranean river, we submit that the distinction is not important. Call it groundwater, sheet-water, percolating water, its effect and value to Kansas, and the damage resulting from its deprivation and the destruction of its source and cause, remain the same; and, under recent decisions, it matters not what definition is given it, the right of those who own land affected by its presence

remains the same, and definitions and abstractions cannot affect the rights of Kansas or the wrongs done by Colorado.

SECTION 10. Contradictory Allegations.

In section XIV counsel for Colorado have found what they consider contradictory allegations in our bill and in our brief. This is founded on the fact that, to show the many and varied benefits of the Arkansas river to the state of Kansas and its citizens, we have mentioned these benefits and losses in detail. Counsel have claimed, because we have described different uses, that therefore we have made contradictory allegations and have presented conflicting claims. But this is not true. Our right is one, although our uses may be many. It is no objection to the replevin of a horse that the plaintiff may use the horse for riding, driving, plowing, or breeding. Kansas and its citizens used the water before depletion for drinking, domestic purposes, mill purposes, agricultural purposes in different ways and by different means. But this does not constitute different rights. If the issues of this cause are to be determined by the common-law doctrine of riparian rights, then Colorado has interposed no defense. If the issues are to be determined by the doctrine of prior appropriation, then Kansas is prior in time and prior in right. The appropriations in Colorado prior to 1884, as shown on page 123 of our former brief, are too insignificant for consideration. Counsel cannot obscure their indefinite defense by charging different uses of the property to be recovered by the complainant. Nothing said by counsel in section XIV has any bearing upon this case.

SECTION 11. No Riparian Rights of Irrigation in Colorado.

In division XIV counsel for Colorado assert that Kansas is precluded from claiming any riparian rights because of certain statutes of Kansas providing for the condemnation of water for irrigation purposes within the limits of Kansas. We have already fully treated this contention, and it is hardly

necessary to go over it again. We do not object to Colorado's system *per se*, but only complain of it when in its administration it injures Kansas. Oklahoma could not complain of any system that Kansas might inaugurate as to the distribution of the flow of the Arkansas unless such system injured Oklahoma. We complain of the Colorado system, not because they have adopted the doctrine of prior appropriation, but because they have so administered it by making merchandise of the water and as a matter of profit completely diverted the flow of the river, to the injury of Kansas.

In division XV counsel for Colorado assert that because of our claim that the Arkansas is a navigable stream there are no riparian rights in Kansas. If this be true of Kansas, it is equally true of Colorado, for the evidence shows that the survey of public lands was meandered to the bank of the Arkansas as far west as Pueblo. If because of this meander there are no riparian rights in Kansas, then there are none in Colorado. Both would stand upon an equal footing, and their rights must be adjusted upon some other principle of law and justice.

In divisions XVI, XVII and XVIII are found some startling propositions. Counsel argue that under the common law Colorado has a right to take all the water of the Arkansas river for irrigation purposes. Counsel, however, do not say in this brief whether the common law is in force in Colorado or not. They do not say whether the law of prior appropriation is in force or not. In fact, they do not now say which law, if either, is in force in that state. "Why do they not come to the fact? Here the defense is wholly indistinct. The counsel neither take the ground, nor abandon it. They neither fly, nor light. They hover. But they must come to a closer mode of contest." If the common law is in force in Colorado, they cannot justify taking all the water for irrigation purposes. If the law of prior appropriation is in force, they cannot justify taking any of it in the manner it is shown they take it.

After the original bill was filed in this case the defendant Colorado filed a demurrer thereto, and counsel filed elaborate and carefully prepared briefs and arguments in support thereof. In this demurrer and in their briefs and arguments counsel for Colorado took the ground that the law of riparian rights was not in force in that state, and that their only law was the law of prior appropriation.

In the answer filed by Colorado to the amended bill counsel allege that the land along the river in that state is arid and incapable of producing crops without irrigation, and that they have a system of irrigation founded upon the law of prior appropriation for the irrigation of arid and non-riparian lands, and they allege, and the proof shows, that the right to use the water of the Arkansas river for irrigation in Colorado depends upon the order of appropriation, and that appropriation depends upon a legal decree and a beneficial use, and that first in time is first in right. Taking into consideration the answer of Colorado, the briefs and the oral argument of counsel on demurrer, and the testimony concerning the land along the river, and the uses and methods of irrigation in that state, the following propositions must be true:

First. There is no riparian law for irrigation in Colorado.

Second. There is no riparian land used for irrigation along the river in Colorado.

Third. There is no riparian use of water for irrigation in Colorado.

These should be considered in their order concerning the irrigation of the lands in question.

1. There is no riparian law for irrigation in Colorado.

Section 5 of article XVI of the constitution of Colorado is as follows:

"The water of every natural stream, not heretofore appropriated, within the state of Colorado, is hereby declared to be the property of the public, and the same is dedicated to the use of the people of the state, subject to appropriation as hereinafter provided."

Section 6 of the same article provides:

"The right to divert unappropriated waters of any natural stream for beneficial uses shall never be denied."

In the answer of Colorado, found on page 96 of the record, it is alleged that "the legislature of Colorado enacted certain statutes providing for the adjudication of rights to water by appropriation for agricultural purposes from the streams in said state." The supreme court of the state has upheld these statutes many times. On page 51 of the brief of the defendant in support of the demurrer counsel then said, in regard to the mountain states: "Either with or without the aid of statutory expression, these states have declared that the common-law rule of riparian rights has been abandoned or has never existed within their arid regions." On page 61 counsel then further said: "In Colorado, all the water of the streams is declared to be subject to appropriation, and the common-law rule of riparian rights is held to have never been part of the law of the state." On page 11 of their reply brief on the demurrer the counsel for Colorado then said: "The fact remains that the common law of riparian ownership never applied to the region in controversy from the hour the white man planted himself in its wilderness and made its lands its dwelling-place. He could not have lived under its operation and therefore he discarded it, if it ever had even an abstract existence, for the only substitute compatible with the environment. . . . There is not an arid region in the world to which the law applied at any time in its history. It would be fatal to all schemes of habitation." Again, in their reply and supplemental brief, on page 18, counsel for Colorado then said: "That the wisdom, justice and necessity of the policy of Colorado respecting its waters, as expressed in its constitution and statutes, cannot be questioned, needs no argument." In the oral argument on the demurrer, Mr. Rogers, on page 40, says: "That in an arid region the water which, under other conditions, might be deemed as at common law an in-

cident to the land over which it flows, and concerning which there may be certain property rights in the landowners, does not obtain; but that every drop of that water may be taken out and used beneficially by non-riparian proprietors, and rights thereby be built up with respect to it, in derogation of the rights of the adjoining riparian owner, as they would exist at common law." Again, on page 132 of the oral argument Mr. Thomas says: "In the first place this question could not arise between two riparian owners in Colorado. The right there is not recognized." In view of all this, we assert that in regard to irrigation the law of riparian rights is not in force in Colorado. Superiority of one water-right over another water-right is sustained, and the time and amount of the appropriations are made matters of record. All this is in complete derogation of the common-law riparian rights. The counsel then argued that the upper state had the right to take all the water of an interstate river, and the lower state had no remedy, however great the injury. Upon this astounding statement Messrs. Justices WHITE, BREWER and BROWN put the following questions to the counsel, which elicited the following answers:

Mr. Justice WHITE: "Your idea is this, then: Take the Connecticut valley, where a river flows partly in Massachusetts and partly in Connecticut, we will say. The state of Massachusetts could pass a law to take out all the water from the river, and leave the Connecticut valley, with its teeming population and great industries, in desolation and ruin, and there would be no redress under our system for the people of the state of Connecticut, because the state of Massachusetts has the absolute power to appropriate that water which, in nature, is not restful, but is forever running?"

Mr. GODDARD: "Yes, I say that that would be a thing that conditions would very rarely justify, but I say that a state has the right, where the necessities exist, to provide that the running waters in its limits can be appropriated and diverted to non-riparian land for beneficial use."

Mr. Justice BREWER: "Do I understand you to claim that a state has a right to appropriate all the waters that flow through it and run into another state, so that none shall go into that state?"

Mr. GODDARD: "Yes. I understand, under the doctrine of the Rio Grande case, that the state has a right to provide what use may be made of its waters; it may repeal the common-law riparian doctrine, and may use it for appropriation."

Mr. Justice BREWER: "Can the state, either by itself or by authorizing its corporations or of its citizens, appropriate all the water of a running stream, so that none goes into the adjoining state? Is that your contention?"

Mr. GODDARD: "Yes, sir, that is my claim, although I say, your honor, that it is an absolute physical impossibility. It cannot be done, but I say that they can use the waters for appropriation and irrigation, and they will then go back and percolate through the soil and return to the stream in the underflow."

Mr. Justice BROWN: "I do not quite see yet why the state of Colorado may not, by building irrigating ditches and a reservoir, or authorizing them to be built, impound the entire waters of a river before they reach the state of Kansas. They might do that, might they not?"

Mr. GODDARD: "Yes, they might."

At this time counsel for Colorado stood upon the doctrine of prior appropriation and the constitution and the laws of Colorado, claiming recognition therefor under the act of 1866, and wholly rejected the common law of riparian rights so far as applied to interstate streams. Counsel for Colorado maintained and insisted that a state line was a barrier to any claim for wrongs inflicted upon a lower state. Throughout their argument and brief they clung closely to the doctrine of prior appropriation, and the state line between Colorado and Kansas as a protection to that doctrine. When the testimony was taken in this case it was shown conclusively that the seven ditches in Kansas were prior in time and right to the large appropriations in Colorado. The decisions of the federal and state courts which we have cited, handed down within the last few years, have conclusively wiped out state lines as to irrigation on interstate rivers.

2. There is no riparian land used for irrigation along the river in Colorado.

It is admitted in the answer filed in this case that the

waters of the Arkansas river are diverted in the state of Colorado, and are applied to the irrigation of land within the drainage area of the river, which land, according to the allegation of the answer, "before said diversion and use, was arid and incapable of producing crops," the only requisite as to location being that the land was not beyond the divide on either side. That this land was "arid and incapable of producing crops" in its natural condition is also an allegation that it was not affected by the presence of the flow of the river. As to what lands are riparian to a stream, in the case of Clark v. Allaman, 80 Pac. 585, the court says:

"Within these limits, the principles of equality of right announced above should control the use of water for irrigation purposes by those whose land is affected by the presence of the stream, irrespective of the accidental matter of governmental subdivisions of the land."

As to whether the land along the river in Colorado in its natural condition was arid, barren, and unaffected by the river, the evidence is very pointed and conclusive. The lands of the Graham Ditch Company are not far from the Kansas line, and of them Mr. Hillyer, the administrator of the estate of Mr. Graham, says:

"All crops raised on these lands are raised by irrigation, and no crops could be raised without it. These lands were arid lands before they were reclaimed by the Graham Ditch Company." (979.)

Mr. Wiley, the superintendent of the Amity system, says:

"Yes, sir, I stated in my direct examination that the total productiveness of the lands of our system is derived entirely from irrigation. Those lands were entirely arid before they were irrigated, producing nothing excepting the ordinary arid vegetation, such as sage-brush and a few such species of vegetation." (1453.)

Mr. Emery gave a detailed description of these lands, and says:

"This adobe soil is a soil that is very fine when it is pulverized, as fine as ashes, and in places and under most conditions is very compact. I should say that I did n't find any places in the valley of the Arkansas river from Lamar to Pueblo

where the soil in its natural state was saturated with water so that vegetation would grow upon it. I found cactus and greaseroot and sage-brush and Russian thistles very plentifully where it had not been cultivated. At most places this condition extends down to the banks of the river in its natural state. I saw nothing of the kind from Lamar to Pueblo that corresponds with what is known as the first and second bottoms along the Arkansas river in Kansas." (541.)

These quotations and others of a similar import show that there is no land along the Arkansas river in Colorado that is affected by the presence of the river, and hence, under the common-law doctrine, they have no riparian rights to protect. But both counsel and witnesses attempt to avail themselves of any doctrine or position that they think is available. Upon this point Mr. Wiley says:

"Yes, sir, I spoke about riparian lands, and that our system founds one of its rights to the use of its water upon the riparian doctrine. When a man has got as large an investment to be responsible for as we have, he needs all the foundations for it he can get, and I am going to take advantage of all that they give me, either here or elsewhere; but our appropriation doctrine is the one upon which we demand our water during these fights you talk about; but we will very naturally employ either of them that helps us out. If I lean on one stick and it breaks, I will get another crutch. Investment in irrigation has not been a profitable one under any conditions, and it would seem that anything to make it less profitable to the individual and frighten him away is grasped at by the country at large with avidity, while they go ahead spending millions of the people's money in ventures that they discourage other people from going into." (1452, 1453.)

In this part of their brief counsel for Colorado still "hover," and are in favor of any position that seems to them most available. But neither the assertions of counsel nor the "sticks" or "crutches" of witnesses can change the character of the land they irrigate, which was arid, barren, and unaffected by the presence of the river, and is therefore not riparian in any sense of the term, and no riparian rights can attach to it.

3. There is no riparian use of water for irrigation in Colorado.

The state of Colorado in its distribution of the water of the Arkansas river, and the ditch companies in their use of it, do not exercise these rights and powers subject to the equal rights of any one else. Their spillways are built for the protection of the ditches and not for the benefit of some one below them. The water is carried many miles back from the river, and is spread out on land that is arid and barren, and hence cannot be riparian. Each right is complete in itself as to amount and time, and regardless of the interests and needs of any one else. Whether a ditch is supplied with the full amount of its decreed appropriation depends upon the amount of water in the river and the priority of the decree, and no attention is paid to the urgency or the reasonableness of the inferior right of a subsequent appropriator. The distribution by the state officers and the use by the irrigators are according to appropriation and not according to proprietorship.

The defendants, then, in this case have no interest in or right to the waters of the Arkansas river for irrigation purposes under the law of riparian rights; none as proprietors, either among themselves or against the complainant or any of its citizens. The defendants have no rights not founded in law, or in fact, or in use. They cannot, therefore, plead any riparian rights as a defense in this action.

These defendants, however, have legal rights in and to the waters of the Arkansas river. These are the rights decreed to them as set out on pages 124 and 125 of our former brief, and these rights, when added together by years, are found on page 123 or our former brief. It is admitted in the answer of Colorado, found on pages 95 and 96 of the record, that

"From and including the year 1880 to the year 1890, 250 additional ditches and canals were constructed and 3859 cubic feet of water per second of time thereby diverted from said river, and at all times since continuously used when obtainable in the irrigation of land in said valley. All of said ditches and canals have been constructed by individuals and corporations, and the water, when obtainable, has been taken from

said river and applied to the reclamation and irrigation of about 500,000 acres of land in said valley which, before said diversion and use, was arid and incapable of producing crops, all of said lands being in the watershed of and riparian to said river, and none of the waters of said river being diverted and carried to lands beyond the watershed of said river."

The total appropriations of all these ditch companies from 1867 to 1891, both years inclusive, are 4240.49 cubic feet per second. All these appropriations and rights are subsequent to the prior interests and rights in Kansas, except the 2.5 cubic feet in 1867, and the 16 cubic feet in 1869. If the defendants had plead, proved and claimed these 18.5 cubic feet as prior to the rights of Kansas we should have conceded that much. But they have not done so, and hence cannot recover even that amount. This amount of 4221.99 cubic feet is all subsequent and inferior to the prior rights of Kansas and its citizens. The lands in the Arkansas valley in Kansas were settled prior to 1884, the Arkansas City water-power was instituted prior to 1884, and seven of the Garden City ditches were constructed prior to 1884, as shown on page 110 of our former brief. Under the law and upon these facts, Kansas has the right to recover the full normal flow of the river as against any and all these subsequent appropriations in Colorado under another law and for different lands and a different purpose. Colorado does not share these waters with the riparian proprietors in Kansas, and cannot require the state of Kansas to share these waters with Colorado for subsequent and different purposes. This becomes apparent when the case is reversed.

If these appropriations in Colorado had all been made under the same laws, for the same lands, and for the same uses, but all prior to the admission of Kansas into the Union, and the deeding of its lands, and the acquiring of the rights of its citizens, then in an action by Kansas similar to the present action Colorado could successfully defend on the ground of its priority, its laws, and its customs. Colorado could plead and claim a different law, different lands, different

uses, and priority in time, and that they would not be compelled to share such waters so appropriated with the state of Kansas and its citizens, to be used for subsequent and different purposes. We affirm emphatically that under such conditions Colorado could legally retain all such waters, and no division could be enforced.

Upon the facts, then, as shown in this case, Colorado cannot enforce a division of the waters of the river, to be used in that state under a different law, on different lands, and under different uses and customs, when all these appropriations are subsequent to the prior riparian rights of Kansas and its citizens. Colorado cannot insist upon a share of the waters of the river under the law of riparian rights, unless they have that law in force, use the water on riparian lands, and according to riparian irrigation. Without such a law, without such land, and without such a use, Colorado cannot demand a share or division of the waters of the river for different purposes. In order to compel a division both parties must be under the same law, irrigating riparian lands, and according to riparian uses and customs.

As between a proprietor under one law and an appropriator under another law, a contest becomes merely a question of priority.

The position of counsel in this part of their brief is in favor of their constitution and irrigation statutes, or against them, as will suit their convenience. They are even in favor of riparian rights in Colorado if that is the stronger position. They then evolve the anomalous doctrine that under the common-law riparian rights the proprietor furthest up the stream has a right to take all the water for irrigation purposes.

Counsel for Colorado cannot escape from their education under the arid states' doctrine that there must be a dominant servitude in the upper state. The whole theory of the common law was equality of right. Geographical position mattered nothing. The upper proprietor might use a certain amount of water for irrigation, as well as for other purposes,

but he could not use it to the exclusion of the lower proprietor. His use must be reasonable and consistent with the right of the lower proprietor. The theory of Colorado as now announced in their brief is a hybrid, a monstrosity; something that belongs neither to the common law nor to the arid states' doctrine. Upon the one hand they assert the existence of the common law in Colorado and Kansas, and then seek to engraft upon it that idea of monopoly which is the foundation of the arid states' doctrine. The common law insisted upon parity between the proprietors, whether above or below. The cases that counsel cite all insist upon this doctrine. No water can be taken for irrigation, even ten feet from the river-bank, if it impairs the equality between all proprietors along the river. Irrigation has not a right superior to bathing, stock purposes, or any other right, but stands exactly upon the same footing; that is, that every proprietor along the river, above or below, without regard to situation, has an equal right, a parity of use; but Colorado, while admitting the force of the common-law doctrine, seeks to change it, and insists that the upper proprietor has a dominant servitude because of his needs that will permit him to take, divert and use all of the flow without regard to the right of the lower proprietor.

In our former brief we cited numerous cases upon this point, some of them being Howell v. Johnson, 89 Fed. 556; Hoge v. Eaton, 135 Fed. 411; and United States v. Rio Grande Co., 174 U. S. 690. Since the preparation of our former brief the case of Anderson v. Bassman, 140 Fed. 14, has been added to the list, and the third section of the syllabus is as follows:

"In California the common-law rule of riparian rights, and not that of prior appropriation, governs the right to use water from a stream for purposes of irrigation, each riparian owner having the right to make a reasonable use of a reasonable quantity of water on his land. In Nevada the rule of priority of appropriation governs, without reference to whether or not the lands are riparian. *Held*, that riparian owners of lands on a stream in California and appropriators of waters for irrigation purposes from the same stream lower down in Nevada were equally protected in the rights given them by

the laws of the respective states, both subject to the limitation that a reasonable quantity of water only for he beneficial use to which it was devoted should be taken; that it should be economically distributed, and the surplus unused returned to the stream; that where the quantity of water in the stream was at times insufficient even for the users in California, they would be restrained from diverting water from the stream during such part of the time as would give to the lower users in Nevada their just share."

Under these cases Colorado has no defense, either under the doctrine of appropriation or the doctrine of riparian rights.

The view of counsel on pages 327 to 333 of their brief is indeed characteristic, and on page 332 of their brief they say, in reference to the case of Clark v. Allaman:

"We have, then, here an irrigation case turning upon what the court construes to be the common-law riparian rights, in which it is held that the upper riparian proprietor has the right to use the water to irrigate his lands, however extensive those lands may be, the only limit being the divide that separates the drainage from the next stream. (Page 585.) The court holds that such use is a reasonable use, authorized by law, even though in a time of drought it consumes the entire stream, leaving none to flow to the lands below, and that the riparian right of the lower proprietor is only such as she can enjoy without encroachment upon these rights of the upper proprietors. Her 'vested rights' in the flow of the stream are held to be subject to the later rights of the upper proprietor, who has the advantage of position on the stream."

For some reason unaccountable to us counsel have misunderstood this case of Clark v. Allaman. Mrs. Allaman, the plaintiff below and the defendant in error, was a lower prior appropriator, and brought an injunction proceeding against upper and later appropriators. On page 573 the court says:

"In an action for an injunction brought by the plaintiff, Lizzie Allaman, to restrain the use of water from Rose creek by irrigators living up the stream, the district court, in a decision supported by an able and exhaustive opinion, apportioned the water among the various claimants according to the law of prior appropriation in vogue in certain of the Rocky Mountain states, rejecting altogether the rules of the common law relating to riparian rights. As a result, the plaintiff was given damages, and the superior right to substantially the entire quantity of the flow of Rose creek in unpropitious seasons. The legal propriety of such a judg-

ment is a question of first impression in this court, and now must be determined. The subject, however, is not a new one with the courts. It has been discussed with great ability by many distinguished judges and text-writers, definite doctrines have been established in all sections of the country, and a wealth of learning already has been accumulated, and lies ready to hand for application."

The court below entered judgment for the plaintiff, which judgment was reversed by the supreme court without a dissenting opinion. Counsel say, on page 329 of their brief: "The supreme court reverses the judgment of the court below, applies the common law as the court construes that law, and gives superiority of right to the upper riparian proprietor." In this last clause of this statement counsel are in error, and from their Colorado training assume and assert that some one must be superior to some one else. But the court in this case did not decide in favor of the superiority of one over the other, but distinctively repudiated superiority and established equality. On page 584 of the opinion the court says:

"That a portion of the water of a stream may be used for the purpose of irrigating land we think is well established as one of the rights of the proprietors of the soil along or through which it passes. Yet a proprietor cannot, under color of that right, or for the actual purpose of irrigating his own land, wholly abstract or divert the watercourse, or take such an unreasonable quantity of water, or make such unreasonable use of it, as to deprive other proprietors of the substantial benefits which they might derive from it if not diverted or used unreasonably."

The eleventh section of the syllabus is as follows:

"The use of water by a riparian proprietor for irrigation purposes must be reasonable, under all the circumstances, and the right must be exercised with due regard to the equal right of every other riparian owner along the course of the stream."

This case closely follows the case of Crawford Company v. Hathaway, 93 N. W. 781, where the twenty-eighth section of the syllabus is as follows:

"The common law does not give to a riparian owner an absolute and exclusive right to the flow of all the water of the stream in its natural state, but only a right to the benefit

and advantage of the water flowing past his land, so far as consistent with a like right in all other riparian owners."

(See, also, Cline v. Stock, 98 N. W. 454.)

Under the rule here laid down the error of counsel is manifest, and they can have no superiority at all. But the rule goes further, because the evidence shows that there are no riparian lands along the Arkansas river in Colorado, where the lands down to the very banks of the stream are in their natural state arid and non-saturated, and not "affected by the presence of the stream." This aridity and non-saturated condition of their soil is everywhere recognized as the main reason why Colorado has abrogated the common-law doctrine of riparian rights, and substituted the doctrine of prior appropriation. This later doctrine has been acknowledged by all parties until this brief was filed by counsel for Colorado in this case. Former counsel for Colorado, upon the demurrer to the bill, strenuously argued that the common law as to the uses of water of streams for irrigation was not in force in Colorado, and they then relied upon their doctrine and use of prior appropriation. The only reason we can suggest for this change of position of counsel is from the fact that even under the doctrine of appropriation the undisputed proof is that Kansas is prior in time and therefore prior in right. Counsel have fallen back upon the doctrine of riparian rights simply to avoid inevitable defeat upon the doctrine of prior appropriation.

We repeat now what we said in our former brief, that we do not ask that the doctrine of riparian rights for irrigation be extended to the state of Colorado. We believe it would be injurious to them, and ruinous to the reclamation act of June 17, 1902. Colorado had better suffer defeat at the hands of this court, and supply the needs of their irrigation ditches along the Arkansas river by a well-devised and well-constructed system of reservoirs for the purpose of impounding all the flood and excess waters of the river and all the tribu-

taries, and let the natural stream run as it was accustomed to flow through all the early years.

That the water of the river is used for other than riparian purposes and for an entirely foreign purpose is shown by Mr. Wiley, where in his testimony he describes the peculiar uses and peculiar methods practiced:

"I regret to say that after this has occurred, and the lands under these ditches with early priorities have become useless, there has been a tendency to take that water and sell it to cover a new body of land or a new use, to our detriment and loss. I do not say I think this has grown into more than a tendency, sir, I know it. The loss which the river has sustained by carrying out a new and greater use of the water has been enormous, and has been sufficient to affect very seriously the amount of water that subsequent appropriators had a legal right to." (1451.)

Counsel will not be able to put up a legal defense to this kind of appropriation, use and sale of water.

On page 344 of their brief counsel say:

"As water, however, is an element essential to the life of man and beast, and essential to the growth of vegetation, which furnishes the food for man and beast, the necessity in an arid country of utilizing the stream for the sustenance of the people is so apparent, that the ordinary riparian rights of lower proprietors in a humid country, by the very laws of nature, must yield to those preferred rights which grow out of necessity, in the arid region whence the stream comes."

This is a very mild statement of their doctrine of necessity. But this law of necessity as against the prior vested rights of some one else has never received the sanction of the courts. There can be no such things as "preferred rights which grow out of necessity," which can be set up as overriding prior vested rights protected by constitution, laws, and judicial decisions. In the distribution of the water of the river the officers of the state of Colorado do not look to the needs, the necessities or the prior rights of the citizens of Kansas. They simply take it all.

We think this is the first time that it has ever been contended in court that prior and vested rights must yield to any

necessity subsequent in time. Should this court approve this claim and his doctrine of necessity, there must be a revision of the whole law of property rights. We had supposed, until we read the brief of Colorado, that there was no branch of the law more thoroughly settled than that which protects vested rights, but it seems now that there is a higher law—that is, the law of necessity. Who created this necessity in Colorado? The people of Kansas had invested their money in lands and industries, including water-power and irrigation ditches along the Arkansas river, while the lands of the Arkansas river in Colorado were still a barren waste, occupied by lonely spears of scattered grass and sage-brush. Observing the prosperity of Kansas, the people of Colorado came and settled upon these lands in Colorado, destroyed our prosperity, and thus created that "necessity" upon which they now base their case. If necessity is the higher law, any man may take my horse and plead that his necessity was above my property right. The squatter who desires to till the soil may deprive the owner of it, if it can be shown that the squatter's necessity is greater than that of the owner. However, it is idle and absurd to argue such a monstrous proposition as this.

We shall conclude this branch of the subject with the following quotation from Benton v. Johncox, 49 Pac. 497:

"It certainly cannot be true that a difference in climatic conditions or geographical position can operate to deprive one of a right of property vested in him by a well-settled rule of common law. The mere fact that the appellants will not be able to occupy or cultivate their lands as they heretofore have done unless they can irrigate them with water taken from the Ahtanum river is no sufficient reason for depriving the respondents, who settled upon that stream in pursuance of the laws of the United States, of the natural rights incident to their more advantageous location. The necessities of one man, or of any number of men, cannot justify the taking of another's property without his consent, and without compensation. If it be true, as claimed by appellants, that, if the judgment of the court below is affirmed, their lands will again become a barren waste, and cease to 'blossom as the rose,' it is equally true that, if the waters of the river are diverted from its channel, the premises of the respondents will become unproductive and utterly worthless."

We can add nothing to the reasoning of this case. It is unanswerable, and destructive of Colorado's contention.

This case is not an application before a commission to distribute water; it is a lawsuit before a court, to determine the legal rights of the parties, and then to enforce them. Kansas has proved its case, and Colorado has shown no defense, not even to the 18.5 cubic feet appropriated prior to 1870. We are not asking that any of the citizens of Colorado be restrained from using the waters of the river for natural purposes—*ad lavandum et ad potandum*, but we are objecting to the use of the river for new, subsequent and different uses than those known to the common law. We claim the right to a decree against the state of Colorado and its officers, restraining them from giving the ditch companies any or all the normal flow of the water of the river, to the detriment of any or all the prior interests in Kansas. That much we have proved, and to that decree we have a right at the hands of this court.

One thing more upon this branch of the subject. We do not insist that the common law of riparian rights of irrigation is in force in the state of Colorado as to its citizens *inter sese*. As to whatever flow of the river Colorado is entitled to it may distribute in any manner that it sees fit under its own laws and customs. We of Kansas claim the same right. The irrigation laws in Colorado are no defense to a suit between the states for this wrongful diversion. The peculiar system of Colorado is no more a defense to this suit than the irrigation laws of Kansas. We assert that the common law was impressed upon all this territory before Colorado became a state, before it had a peculiar system of its own, before it had a constitution or any law; that under that common law rights were vested in Kansas, and that those rights are to be determined as between the states in this suit, not by the peculiar system of Colorado or the peculiar system of Kansas, but by that law which was common to both states and under which

the vested rights were acquired in Kansas. When counsel for Colorado claim the existence of the common law for irrigation in Colorado, they nullify entirely their own constitution and laws, but their admission is binding, as we herein define it; that is, that it is the common law that is to regulate the rights of the two states in this controversy. When the rights of the two states have been determined, administered and enforced by a decree of this court, then each state may apportion the water acquired under this decree according to its own system.

This is, perhaps, a repetition of much that we have said before, but we cannot too strongly insist upon this distinction which every lawyer employed by any of the defendants has persistently ignored. It seems to us that the persistent silence of all the defendants as to this distincion, their refusal of any attempt to answer, is one of the most significant features in this case. In our judgment it is the pivotal point of the case, the point upon which the whole controversy turns, and from the hour that Kansas first asked leave of this court to file its bill until now, Kansas has consistently maintained, asserted and reasserted this position. We have accepted its full consequences, admitted every conclusion that could be drawn from it, and we stand to-day just where we stood when the original bill was filed. Colorado has taken inconsistent positions, twisted, turned, changed its attitude, swapped horses while crossing the stream, and to-day counsel for Kansas do not know what position counsel for the defendants will finally assume and agree upon when this case is to be argued. We do not care. We renew the assertion of our former brief, and stand upon that common law, pure and undefiled by the cloudy contention of Colorado, upon which this suit was originally brought, and upon which we insist upon a decree in this case. In the suggestions that we shall later make as to our view of the decree in the case, we shall endeavor to embody our earliest and our latest contention in this cause in one consistent and workable solution of the whole question.

SECTION 12. The Graham Ditch Company.

In its brief filed herein the Graham Ditch Company makes one point. It assumes that the common-law doctrine of riparian rights for irrigation purposes is in force in Colorado; it further assumes that its lands are riparian lands; and then counsel claims a prior and superior appropriation of sixty-one cubic feet per second as of August 24, 1891.

In all this counsel is in error. In accordance with all former contentions of counsel for defendants, the common law for irrigation is not in force in Colorado, but the law of prior appropriation has been substituted therefor. If the common law is in force in Colorado, then there can be no such thing as priority or superiority of appropriation.

Again, the evidence shows that the lands of the Graham Ditch Company were arid lands. As quoted before herein, the administrator testified their lands were all arid before their irrigation. Such lands do not come within the definition of riparian lands as found in the cases heretofore quoted.

But if the common law is in force in Colorado, and if these lands are riparian, then the Graham Ditch Company could only have an equal right in the waters of the river with all other riparian proprietors. It could not have sixty-one cubic feet, nor any other particular amount, and no decree of a Colorado court could give it priority over the equal rights of other proprietors, nor give it any priority as of any date. The claim of counsel cannot be upheld under the law of riparian rights.

SECTION 13. The Amity System.

In the brief on behalf of the Arkansas Valley Sugar Beet and Irrigated Land Company, counsel say that this suit was instituted on behalf of the irrigation ditches of western Kansas. This statement is gratuitous, if nothing worse. Counsel also state that the Amity canal, to the extent of thirty miles of its length, is as much a Kansas enterprise as any Kansas ditch. This statement is hardly true in view of the evidence

of Mr. Wiley, the superintendent of the Amity system, found on page 1445 of the record. Mr. Wiley testifies that the Amity ditch has not been operated across the line in Kansas for the last five years, and that while they owned land in Kansas at one time, at the present time they own practically none, and at the present time the east end of the ditch is at Horse creek, four miles west of the Kansas line. But if the Amity ditch should be operated in both states, still all the rights of the whole Amity system are subsequent to all the rights of the complainant. The rights of the Amity system are as follows: Fort Lyon, 164.64 cubic feet of April 15, 1884, and 597.16 cubic feet of March 1, 1887; Amity, 283.5 cubic feet of February 21, 1887; and Buffalo, 67.5 cubic feet of January 29, 1885. Under the law of prior appropriation, all the rights of the Amity system are many years subsequent to the Kansas priorities.

Counsel has something to say about the Kansas statutes and irrigation laws. But these statutes have nothing to do with this case. This action is not between different interests in Kansas, but is between the state of Kansas and all the interests in that state and the state of Colorado, which controls all the water of the Arkansas river within that state, and the principal ditch companies which are the recipients of its diversions and divisions.

Counsel seem somewhat worried because this court cannot in this case pass upon the relative priorities of the individual ditch companies in Kansas and Colorado. Counsel do not deny and do admit the correctness of the dates set out in our former brief. They admit that Kansas was admitted as a state prior to Colorado; that the lands owned and deeded by Kansas had their rights fixed and became vested prior to any rights of the Amity system; that the entry and cultivation of the Kansas lands were prior to the Amity appropriations; that the water-powers in Kansas are prior to the Amity rights; that the Kansas ditches, with a single exception, are

all prior to the Amity appropriations. With these later and subsequent appropriations, the Amity system stands across a state line and insists upon taking all the water of an interstate river, to the injury of the prior rights below. To this allegation of the bill the Amity system has set up no defense whatever upon the doctrine of prior appropriation.

In the ingenuity of counsel another defense, however, is attempted. On page 12 of their brief counsel say: "Either Kansas stands for the doctrine of riparian rights, as its counsel announces that doctrine, or it stands for the doctrine of appropriation to beneficial uses. It cannot stand for both, as the one is destructive of the other." In this statement counsel "hover" no longer, they "light." The statement is true. Kansas stands for the doctrine of riparian rights as announced in the latest decisions of the courts of last resort. Where does Colorado stand? The constitution of Colorado, its laws and the decisions of its courts and the brief of counsel of one defendant say the law of prior appropriation is in force in that state, while counsel for the state of Colorado, for the Graham Ditch Company and for the Amity system say the law of riparian rights is in force in that state. In counsel's own language, "It cannot stand for both, as the one is destructive of the other."

But even if the common law is generally in force in Colorado, still the Amity system cannot avail itself of any rights under it. The lands owned by the Amity system never were riparian lands. Upon this point Mr. Wiley says:

"Yes, sir, I stated in my direct examination that the total productiveness of the lands of our system is derived entirely from irrigation. Those lands were entirely arid before they were irrigated, producing nothing excepting the ordinary arid vegetation, such as sage-brush and a few such species of vegetation." (1453.)

Riparian rights for irrigation do not attach to such lands as are here described.

Counsel say that the depletion of the river by the Fort Lyon, Amity and Buffalo canals does not decrease the flow of

the river below to the injury of Kansas interests. But this statement is so contrary to the facts as detailed by the witnesses in Colorado as well as in Kansas that no further reply need here be made. That the Amity system does take all the flow of the river during the growing season was their own testimony, called out on cross-examination of different witnesses (1450), and the depleted condition of the river through Kansas for the last fifteen years speaks for itself. The facts of the case outweigh the theory of counsel.

SECTION 14. The Colorado Fuel and Iron Company.

With the filing of the brief on behalf of the Colorado Fuel and Iron Company a new defense is introduced; a different Richmond is in the field, clad in different armor, riding a horse of a different color, and fighting a different battle. The Colorado Fuel and Iron Company, as appears from the evidence, might have defended in part upon the doctrine of riparian rights for manufacturing purposes, and it is the only defendant to whom this defense would be available. It, however, is the only defendant which repudiates the doctrine of riparian rights for irrigation as to Colorado territory, and stands squarely upon the doctrine of prior appropriation.

One question of fact deserves a passing notice. Counsel have collated the evidence of fifty-four witnesses who, in substance, testified that the river during the time they knew it was "constant," and then collated the evidence of 115 who, counsel assert, testified that the river was "dry" or "no running water," etc. It will be noticed that the fifty-four witnesses who testified to the uniformity and constancy of the flow of the river lived upon the river, many of them for twenty-five years and upwards, and their observations of the flow of the water were from day to day, week to week, month to month, and year to year. On the other hand, the great majority of the witnesses who counsel think found the river dry were travelers across the plains, and saw the river once or twice during the summer months of a dry year, for this was

the only class of travelers the defendants used. The witnesses who saw the river constantly also testified that for some distance it went dry for a few days or even weeks during the extreme droughts of 1859-'60, 1874, and 1879, and would also get low in the fall of a dry year. The witnesses produced by defendant saw the river once or twice during a drought, and many of them during the same drought, but because it was low or dry at that particular time they did not pretend to testify that therefore it was low or dry for weeks, months, or years. The testimony of a day is of no value whatever as against the testimony from observations running continuously through a quarter of a century. Some single witnesses who have lived on the banks for thirty years have seen the river for a longer period and for more days than all the travelers and hunters and soldiers who ever crossed the plains. If counsel think this evidence makes a showing on paper, it surely makes no showing in fact. How the river was for a day or a week in August of a dry year does not show how the river was at all other times and under other conditions. Counsel doubtless saw the weakness and fallacy of their own argument, but it was also doubtless the best they had.

Upon another point, however, counsel have a better standing. The Colorado Fuel and Iron Company impounds water to a large extent, its completed reservoirs having a capacity of 15,800,000,000 gallons. The company uses about 9,000,000 gallons per day, and consumes about 2,500,000 gallons per day. Upon the doctrine of riparian rights all these facts should be taken into consideration, and under that rule water for manufacturing purposes would be distributed accordingly to the facts and the rights of all the lower proprietors. If the law of riparian rights were in force in Colorado, and if the Colorado Fuel and Iron Company were impounding flood-water and turning the residue back into the river after a reasonable use, its rights to a reasonable use might be protected.

But here is the anomaly of the defense. The other defendants who need the law of prior appropriation to protect them

abandon that law which is in force, and seek protection under the law of riparian rights for irrigation, which is not in force in that state. This defendant, which might have some protection under the law of riparian rights for manufacturing purposes, claims it is not in force in Colorado, and appeals to the law of prior appropriation and state control, under which it can get no protection whatever as against the prior rights of the lower proprietors. Under equality of right this defendant might be protected in a reasonable use, but under priority of right its uses are subsequent, and it has no defense. The wires of these different defendants must have become crossed.

This defendant, for and on its own behalf, has filed in this case on final hearing an argument in favor of state control of the waters of interstate rivers. The argument of counsel has the merit of boldness at least, and its humor is delicate. Though all other defendants have abandoned this position, yet will not it. Counsel say, on page 81, it was not "at any time until recently been asserted that this control should not extend to interstate or navigable streams." Counsel again, on page 82, say: "The doctrine announced in the Elephant Butte case (United States v. Rio Grande Co., 174 U. S. 690), if not wrong in its essence, has gone to the limit"; and then on page 98 say: "Every citation and argument we have used against federal control applies with equal force in favor of state control." The position of counsel is that the upper or crest state has the right to control all the water of interstate streams which falls within its borders regardless of the federal government or any lower state. Counsel would overrule, set aside and hold for naught the cases of Howell v. Johnson, 89 Fed. 556; Hoge v. Eaton, 135 id. 411; Anderson v. Bassman, 140 id. 14; Willey v. Decker, 73 Pac. 210; Perkins County v. Graff, 114 Fed. 441, 52 C. C. A. 243, and United States v. Rio Grande Co., 174 U. S. 690. After referring to these cases, counsel, on page 102, say: "Fully recognizing the ability of the courts concerned, and beautiful as are the sentiments in Hoge v. Eaton from the standpoint of sisterly love, they all,

in our judgment, lack foundation in legal principle." This surely is refreshing if nothing more; as refreshing as any statement ever made by a marauding Highlander when caught with the goods in his possession.

> "The good old rule
> Sufficeth them, the simple plan
> That they should take who have the power,
> And they should keep who can."

Counsel treat the Arkansas river as though it were wholly within the state of Colorado, as though all of it would stay there forever, and as though none of it had ever been anywhere else. Counsel claim the right to treat the part in Colorado so as to destroy, and in such manner as has destroyed, the part in Kansas. They deny joint ownership, joint interest, or any interest whatever, in the lower state. Colorado claims that by being further up the stream they have a right to obliterate settlements below. The seizure of Naboth's vineyard was denounced as a crime by Elijah the Tishbite, but Ahab, who slew the Jezreelite and spoiled his land, first offered to buy the vineyard or exchange for it. Colorado has spoiled the vineyard of Kansas without offer of purchase or recompense, and now asserts the measure of its profits as an excuse for the wrong. Ahab had no learned counsel from Denver to defend against his fate at Ramoth-gilead. "I will requite thee in this plat, saith Jehovah."

Counsel may be in earnest, but they do not comprehend the import of their claim to the absolute and unrestricted control of interstate streams. They have belittled the disaster already wrought, and they ignore the devastation that would be wrought in the future. This same argument was advanced by counsel for Colorado on the oral argument in support of their demurrer, where, on page 32 of the oral argument as printed, counsel asserted that the upper "state has the absolute control over these running waters, whatever the result may be to another state," and that the lower state "would have no remedy at all in regard to that matter." This argu-

ment of counsel brought out the questions of Messrs. Justices WHITE, BREWER, and BROWN, heretofore quoted in section 11.

Counsel for the Colorado Fuel and Iron Company have reiterated this argument in all of its hideous boldness, utterly oblivious to the prior rights of all other persons in lower states. The claim of eleven states to the right to secede was constitutionally mild in comparison to the audacity of one state, which, while coming into the Union late, now ignores equality, and arrogates to itself superiority over all.

Counsel seem disturbed because, as they say, on page 114, "Any amicable adjustment of these rights between the users in different states is simply impossible." But that is exactly what the court did do in the case of Anderson v. Bassman, 140 Fed. 14, between users in different states, and it is just what the state courts are continually doing between users in the same state, and when a court has jurisdiction across the state line, that state line no longer remains a barrier. The only reason why the settlement of the conflicting interests along the Rio Grande between New Mexico and Mexico went to a commission, and then to the treaty-making power, was because no court could acquire jurisdiction of a foreign nation. But this court has jurisdiction over both Kansas and Colorado, and a decree of the court can be served directly upon the officers of Colorado, who, according to their own evidence, have the direct control and administration of all the waters of the Arkansas river and its tributaries within the boundaries of that state. The division engineer of division No. 2 is a state officer, directed by Colorado, responsible to Colorado; he can be reached by process of this court, and be compelled to respond to its mandate. The impossibility of execution and complete and effectual remedy is to be found only in the brief of counsel.

Counsel again, on page 125, say: "The riparian doctrine, as Kansas counsel interpret it and which they say prevails in Kansas, does not prevail in Colorado." Again, on page 127, they say: "Kansas claims that in her domain the riparian

doctrine is in force. Colorado claims that in her domain the appropriation doctrine is in force." What they say as to the claim of Kansas is not disputed, but who in this case now relies upon the doctrine of prior appropriation in Colorado? Counsel for the state of Colorado in their brief do not; counsel for the Graham Ditch Company does not; counsel for the Arkansas Valley Sugar Beet and Irrigated Land Company do not. Who, then, do? The counsel for the Colorado Fuel and Iron Company. What the other defendants claim we do not know; we have not been favored with a brief on their behalf. The harmonizing of the Colorado claims must be left to them; it is too much for us.

Counsel is somewhat fearful that a decree in favor of complainant would be futile, but their fears are groundless. Irrigation along the Arkansas river in Colorado need not be destroyed, nor even interrupted, but the present method of taking the water from the river may be changed, their wretched indifference to and shocking defiance of the rights of prior parties to participate in its enjoyment and use may be corrected, the flood and unnecessary waters may be conserved, the Colorado Fuel and Iron Company may be restrained to a reasonable use, and the rights and interests of all parties fully protected.

SECTION 15. The Brief of the Intervenor.

The first paragraph of the brief for the intervenor contains the following statement:

> "A brief history of the case, a description of the parties, an abridgment of the pleadings and the petition of intervenor are set forth in intervenor's printed abstract. This abstract also contains a synopsis of all the evidence submitted."

Counsel for the complainant, all the defendants, and the intervenor, under the order of the court, by mutual agreement, prepared an abstract of the voluminous testimony in this case, which has been printed and is a part of the record. Three months' time was spent in the preparation of this,

which, under the order of the court and the agreement of counsel, became and now is the official abstract of the evidence in this case. Every reference to the evidence in the case in the various briefs filed has been made to this abstract, and it is with much surprise that we now learn that counsel for the intervenor have prepared another abstract of the evidence, to which the above reference is made in the intervenor's brief, an abstract which we have never seen, to which we have never consented, which has no official standing in this court, and which we submit ought not to be recognized by this court as a record of the evidence herein. We have had no opportunity to see this abstract, to know what it contains, whether it fairly presents the evidence or not, and the references to this abstract in the intervenor's brief leave us wholly in the dark and unable to answer statements of counsel upon questions of fact. We insist that the only record that should be recognized by this court is the official abstract prepared under the order of the court, and that no other should be considered in this case.

NAVIGABILITY ABANDONED BY THE INTERVENOR.

At the opening of their argument counsel for the intervenor concede the jurisdiction of the court in this case. We have claimed from the beginning that the bed of the Arkansas river between the meander lines or original banks of the stream is owned by and is under the control of the state of Kansas. This claim is conceded by counsel for Colorado, and on pages 289 and 290 they say:

"On a non-navigable stream, it is a well-established proposition of law that lands which are bounded by the river extend to the middle of the stream, so that the owner of the adjacent riparian land owns by an equally good title the very soil over which the water flows; while along a navigable stream, or one which has been meandered under the authority of the United States, in the manner suggested by counsel for the complainant, the limit of the ownership of the adjacent proprietor is at the meandered line, and he has no right or title to the soil under the water of the stream, which, as counsel very truly says, belongs to the state and not to the adjacent proprietor."

This ownership and control do not rest solely upon the meandering of the river, but rests upon all the facts, circumstances, conditions, and the treatment of it by all the parties. The government first meandered the stream on both banks, and then sent out its engineers, who, upon inspection, reported the river navigable at least below Wichita; following these reports Congress made annual appropriations for the improvement of the navigation, and $94,000 was expended by government officers between Wichita and Fort Smith; boats of all kinds suitable to the character of the river began doing a thriving business; but after the coming of the railroads this means of communication and transportation ceased, and while navigation may have been suspended, the navigability of the river was not affected until the water was withdrawn for irrigation purposes in Colorado. Two juries have decided the fact that the river at Wichita was navigable during the '70's and '80's. The state of Kansas has always treated the river as navigable, as shown by the legislation of 1864 and the memorials to Congress.

In spite of all these facts, counsel for the intervenor, however, claim that the land between the meander lines or the original banks of the river belongs either to the United States or to the abutting landowners. How the title to this land got into the United States the counsel for intervenor, too, are discreetly silent, and how it became the property of the abutting landowners they do not say. These abutting landowners have never claimed it, and if they have claimed some recently made land along the banks, under the doctrine of accretion, the title must have been in some one else before these accretions began. The lower part of the stream in Kansas was surveyed and meandered in 1867, and the upper part in 1872. With the coming of settlers, in about 1870, the boats began running, and by 1877 began to be quite numerous. In 1879 Mr. McKown, an engineer for the government, made his examination of the river from Wichita to Arkansas City, and "had the advantage of seeing the river at a very low stage of water

and in its worst condition." Mr. McKown then says: "On such information as I could obtain, I respectfully submit the following approximate estimate of the cost of improving the river for steamboat navigation at low water." (1853.) Speaking of the bridge at Arkansas City, he says: "A draw would be necessary to allow the passage of boats. In the present state it is an obstruction to navigation." (1854.) This report was filed January 27, 1879. The appropriations of 1879, 1880, 1881 and 1882 immediately followed. He concludes his report as follows:

"That portion of the country tributary to the river in Kansas, from Wichita to the state line, is rich, fertile, and well cultivated, and would derive great benefit from the opening of the river to navigation. But where so much of the river passes through an almost uncultivated country, it is questionable whether the expenses of the improvement would be justifiable." (1854.)

He thus reports "the river at a very low stage of water and in its worst condition" navigable even above Wichita, but thinks the navigation above Wichita might not be justifiable because of the uncultivated condition of the country. Counsel for the intervenor, who never saw the Arkansas river prior to taking the testimony in this case, may be surprised at the action of the government surveyors, the reports of the government engineers, the appropriations of Congress, and the activity of the people who settled along the river between Wichita and Arkansas City in the '70's; and for this surprise we will pardon them. Complainant's exhibit No. 1 shows the river and bridge at Wichita as engineer McKown saw them in January, 1879, and the water there shown he calls "a very low stage of water and in its worst condition," for on the same page he says: "The bridge at Wichita has the lower chord ten feet above low water." Mr. Murdock says: "You see it is ten or twelve or fourteen feet from the bridge down to the water, which was the average stage it used to be." (252.) "The government engineers cleared out some snags and obstructions in the river here and built some jetties

out of willows to force the water into the channel. They did that successfully after awhile. They were regular army engineers and were here carrying out the appropriations that were made. It is my recollection that flour and lumber were shipped down the river." (267.) The river is now and always has been navigable below Fort Gibson, and before the depletion of the river in Colorado the point of navigability was much further up the river. With all these facts before it, the government did not deed the lands between the meander lines to the settlers; the title to these lands remained in the state of Kansas, and it has the title and control of them today. Under these conditions, the title to these lands is in the state of Kansas, according to all the cases so minutely examined by counsel for the intervenor. General surveys, meander lines, congressional appropriations, expenditures by the proper departments, actual navigation by early settlers, state legislation, early and late treatment by every one, all go and combine to establish the title to the bed of the stream in the state of Kansas, and, therefore, as the river under all these circumstances was navigable, the exhaustive discussion of the cases by counsel for intervenor is irrelevant.

The changes in the flow of the river, the narrowing of its banks, the obstruction by islands now thoroughly wooded, have all occurred since the defendants have appropriated the waters for irrigation purposes in Colorado, and they are the responsible parties. The destruction of the navigability of the river since the times when the surveys were made, the meander lines run, the appropriations made and expended, and the times when the juries at Wichita found it to be navigable, and since the times when actual navigation was begun, do not destroy the title of Kansas to the bed of the stream, nor do they take jurisdiction from this court, as was decided in the case of United States v. Rio Grande Co., 174 U. S. 690, although the river may not be navigable now in Kansas, and the highest point of navigation now may be Fort Gibson. The title to the bed of the stream is to be determined by what the

river once was, and not by what it is now in its impoverished condition. The Arkansas river was as navigable in Kansas as the Rio Grande in New Mexico, and it was *for the very purpose of the protection of the navigability* of the Rio Grande that the case of the United States v. Rio Grande Co. was prosecuted.

It may be that it would be of great interest to the land department of the government to have certain titles and the *status* of certain streams running through other sections of the country determined by the court, but we apprehend that the court will not seek voluntarily to widen the issues, which already have some latitude, and the evidence and briefs already taken and filed are somewhat voluminous. Counsel for the intervenor may be laboring under the same delusion that clouds the vision of counsel for Colorado, that the Arkansas river always was what they have seen it since this action was commenced. If they had only seen it in its former volume, the facts would appeal to them in a different way, and their sentences would be tinged with a different feeling, and they could then comprehend the changes wrought at the hands of the Colorado irrigators. A short experience has been to them an unsafe guide.

THE CONTENTION OF THE INTERVENOR.

Counsel for the intervenor resist the claim made by the complainant that the Arkansas river was navigable by law, and contend that Kansas has no standing in court upon this ground; but counsel admit that, aside from this contention, sufficient is presented by the bill to make this controversy justiciable, and to give the court jurisdiction of all the parties and of the subject-mater. It is conceded that the question has never been squarely before this court, and that in the consideration of this cause it must be treated as a still open question. To reply to this portion of the intervenor's brief would be merely to traverse ground we have already covered in our opening brief. The intervenor further contends that the law

of riparian rights does not now and never has applied in its entirety to the Arkansas river in Colorado and Kansas, or, if it ever did so apply, that it has been abrogated and superseded by the doctrine of prior appropriation. It contends that the doctrine of prior appropriation is not only necessary but indispensable to the development of the lands along the Arkansas in Colorado and western Kansas, and it presents at great length the array of interests that will be affected if the decree of this court should rest itself upon the claim of Kansas to a recognition of the doctrine of riparian rights.

While so contending, however, the intervenor as stoutly resists the claim of Colorado that the doctrine of prior appropriation gives state control, and presents with overwhelming force the view that no state enactment and no state constitution can establish a property right in water within its limits as opposed to property rights already acquired by citizens of other states. It enforces the doctrine that we have contended for, that the constitution and laws of Colorado respecting water are controlling only within the limits of that state. They do not confer any rights upon the citizens of Colorado as against the citizens of Kansas. Those rights are to be determined by the general law as established by court decisions and the usages and customs of the country and not by the laws of a particular state. In this we agree with the intervenor.

It is apparent that the intervenor has concluded wholly to disregard the question of the navigability of the Arkansas river as a ground for its intervention in this case, and rests its presence in this case solely upon the reclamation act. It must be conceded that a recognition of Colorado's claim in this case would destroy the reclamation act and deny its benefits upon all interstate rivers. It would prevent the settlement and improvement of millions of acres of arid land. It would retard and largely arrest the future development of fourteen states and four territories. It would be destructive

of all comity between the states, and would, if approved by this court, and enforced, lead in all probability to a system of reprisals between these states and territories, even more destructive than the policy of Colorado towards Kansas, Nebraska, and New Mexico. Kansas, so far as its western portion is concerned, is profoundly interested in the full application of the reclamation act; in its application in its broadest way to all the streams within the arid or semiarid region. We are already deriving some benefit from this great measure. It is altogether probable that the benefits of the reclamation act will be applied to the Arkansas river, regardless of state lines; and that both Colorado and Kansas will derive equal benefit from it.

We have contended throughout the progress of this cause that the apprehended damage to Colorado as a result of this suit was without foundation. Should Colorado be deprived of the right to absorb all the water of the river, should it be distributed between the two states under a decree of this court, should Colorado cease its wasteful use of the water of the river and content itself with a fair and reasonable use, subject to prior rights in Kansas, there would be ample water in the river for both states. And if the reclamation act should be applied to conserve the vast waste of flood-waters, the area of irrigation both in Colorado and Kansas could probably be extended beyond the limits of the lands under ditches now in existence.

We call the court's attention to the fact that the intervenor has no more answered our brief upon the question of the common law than has Colorado or any of the individual defendants. In fact, the intervenor scarcely attempts an answer. Counsel for the intervenor have slurred over, minimized or passed by in silence the great volume of the testimony offered by Kansas as to the damage caused in that state by the acts of Colorado. Wholly absorbed in the reclamation act and the possible benefits to be derived from irrigation, counsel have refused to see the damage caused by the denial of the

common-law doctrine of riparian rights to the citizens of Kansas. The whole burden of the intervenor's brief is irrigation, regardless of prior interests. Counsel apparently can see no other use for water save that. Admitting by failure to traverse our assertion that the people of Kansas settled upon the Arkansas and acquired vested rights under the common law, they contend that those rights can be destroyed, the common law abrogated, by subsequent custom arising in another state. This is the first crucial point in the case. We ask, Have counsel presented any reason for such abrogation and denial of the common law? Have they given a well-considered decision parallel to the case at bar? If so, we have failed to find it. Counsel, in their eagerness to deny our rights under the common law, have assailed our theory that the underflow is a true subterranean stream, but have wholly failed to controvert our claim to the continued supply of this stream, under whatever name it may be called. If this court shall hold that the underflow is not a subterranean stream with well-defined banks, it must hold that it is percolating water, and the modern decisions protect the supply of percolating waters, where beneficial, with almost as much care as they do the supply and flow of underground streams. By whatever name called, we have shown conclusively that the supply of this vast body of water, of incalculable benefit to the valley residents of Kansas, is derived almost wholly from the surface flow of the Arkansas river. We contend that it is the same *damnum* to take from us that water by destroying its supply that it would be to take it from us by direct appropriation.

IRRIGATION *versus* NAVIGATION.

On page 58 of their brief, counsel for the intervenor, in referring to the case of United States v. The Rio Grande Dam and Irrigation Company, 174 U. S. 690, say:

"That case was heard and decided only a few years ago, but yet at a time when the waters of non-navigable streams in the arid region were still generally considered as of greater

value and of more importance to the purpose of navigation at the point where such streams, uniting with others, formed a navigable watercourse, than for the purpose of irrigation where such streams were not navigable. . . . Since the date of the decision last cited (May, 1898) the importance of certain Western rivers as avenues of communication between the states has been constantly declining, while the use of the waters of streams for irrigation purposes has grown in importance."

Counsel then refer to the testimony of Senator Hansbrough, Mr. Newell, and Mr. Mead, in which each of these witnesses makes irrigation of greater importance than navigation. Is not this a question of law, and not a fact to be determined by the opinion of witnesses? It is a matter of common knowledge that petitions have been filed with the War Department praying for the use of the waters of navigable streams for irrigation, even to the destruction of the navigability of the river. It seems from the position of counsel for the intervenor that there is an active contest between the irrigators of the arid regions and the people below them on navigable rivers, and that the demands of the irrigators shall be supplied even though the avenues for interstate commerce along navigable rivers shall thereby be destroyed. Congress has the power to regulate commerce among the states, and has the control of navigable rivers as an avenue of interstate commerce. It may be doubtful whether Congress can destroy interstate commerce, and it may be more than doubtful whether the avenues of interstate commerce can be legally destroyed for irrigation purposes.

THE NORMAL FLOW OF THE RIVER.

On page 62 of their brief counsel for the intervenor say that 750 second-feet is the highest quantity of water which could enter the state of Kansas if undiverted, and that this would raise the river at Wichita, where it is 500 feet wide, about two inches. Counsel then, on page 64, quote the table, heretofore quoted in our former brief on page 125, which was prepared by Mr. J. S. Greene, and introduced in evidence as

exhibit No. 53. The average flow for the twelve months, according to this table, instead of being 750 second-feet or less, which would flow into Kansas if undiverted, would be 1442 second-feet. The 750 second-feet, which is the average flow at Canon City, is largely reenforced by the large tributaries between that city and the state line. If this amount were allowed to flow through the state of Kansas, the injuries complained of in this case would never have been manifest, and no cause of action would have accrued. The mean annual flow of the river in Colorado is fully twice what counsel states it to be, and the error of the statement is manifest from the disinterested evidence of Mr. Greene.

ARID *versus* HUMID.

On page 70 of their brief counsel for the intervenor, in referring to the land where the natural precipitation is insufficient to produce crops, say: "This arid land is fertile if moisture could be applied to it, but is valueless and barren without moisture." To this obvious statement we reply, that this is also true of the humid portion of the United States. Moisture is as necessary to the raising of crops in the humid portion as in the arid portion, and rivers are not only the result but also the cause of humidity. We always have been and now are in favor of the reclamation of the arid lands; but we object to doing this at the expense and to the direct injury of the humid lands lying below, which are already under a high state of cultivation and where extensive property rights have become vested. It seems to us unjust, not even to say unconstitutional, to deprive the humid portion of its natural moisture in order to supply moisture for that portion where it is unnatural and as yet not used. Throughout these fourteen states and four territories there is water enough for all, which can and should be conserved, but it seems to us unjust and unconstitutional to disturb prior vested rights in order to build up new property rights in a barren region. It is this drift and tenor of the argument of counsel for the intervenor to which we object.

Counsel for the intervenor have much to say concerning the policy of the government in regard to the reclamation and cultivation of the arid land as indicated by the legislative, executive and judicial departments. To this policy of the government we never have objected and do not now object, and we indorse the statement found on page 105 of the brief for the intervenor, where President Roosevelt is quoted as saying that "The western half of the United States would sustain a population greater than that of our whole country if the waters that now run to waste were saved and used for irrigation." We cannot agree, however, with the counsel for the intervenor that all the waters of our natural streams as they flow through the humid regions are running to waste; and we cannot agree with the further contention of counsel, that these natural streams should be dried up and the civilization and property rights that have been created along their banks should be either destroyed or materially injured, in order to irrigate a portion of the country heretofore arid and barren. Neither can we agree with the contention of counsel that the navigability of and the navigation on these natural streams should also be destroyed in order to irrigate a barren section. We believe that this is carrying the doctrine of irrigation too far; that it is subverting property rights; that it is destroying interstate commerce; that it is impeding general development and interfering with the general welfare. We never have objected to the impounding, saving and using of flood-waters, and we do not now object to the same, but, on the contrary, strongly urge that it be done, and we believe that this impounding of flood-waters was what President Roosevelt referred to when he said that the waters that now *run to waste* should be saved and used for irrigation.

On page 143 of the brief for the intervenor counsel say that the common-law rule of riparian rights does not prevail in the state of Kansas. For the correction of this statement, we respectfully refer them to the case of Clark v. Allaman, 80 Pac. 571.

On page 144 of their brief counsel for the intervenor seem to object to this court forcing upon the state of Colorado and its people the rules of the common law, which they say the courts and the people of that state have repudiated. To this statement of counsel we reply, that it is not Kansas that is asking for the rules of the common law to be applied to the state of Colorado, but, on the contrary, the only counsel who are asking for such a rule at the hands of this court are the counsel for the state of Colorado themselves.

On page 145 of their brief counsel for the intervenor say that we introduced no testimony to sustain the proposition that the decisions of the courts in the states that are partly humid and partly arid are consistent and logical and may be harmonized with each other, and are such as are best suited to the wants and conditions of those states. We respectfully refer counsel to the decisions from the states of California, Oregon, Washington, South Dakota, Nebraska, Kansas, and Texas, cited on page 208 of our former brief.

On page 151 of their brief counsel for the intervenor say that, notwithstanding the declaration in our former brief, we contend that the "California doctrine" governs the waters of the Arkansas river along its entire length in Colorado and Kansas. To this we reply, that no such claim has ever been made by counsel for the state of Kansas, and the quotation made from the former counsel on the argument on demurrer shows quite the contrary. Counsel for Kansas have always claimed that the doctrine of riparian rights applies to the state of Kansas but not to the state of Colorado, and we have always denied that Colorado has the right to divert the waters of the Arkansas river entirely for irrigation purposes, to the injury of the prior rights in Kansas.

On page 160 of their brief counsel for the intervenor say that four of their expert witnesses made special investigations in regard to the source of the underflow in the Arkansas valley in Kansas, and name Mr. Willard D. Johnson, Mr. N. H. Darton, Mr. F. H. Newell, and Mr. Charles S. Slichter.

According to his own testimony, Mr. Johnson never saw the Arkansas valley prior to 1896, and then his investigations were confined to the region at and above Garden City. Mr. Darton's examinations were confined almost solely to the state of Colorado; Mr. Newell never made any examinations below Garden City; and the examinations made by Mr. Slichter were also confined to this same locality. The bulletin published by Mr. Slichter itself shows that all of his investigations were confined to the Garden City district.

On page 163 counsel for the intervenor refer to the pumping plant at Garden City, and say that they are not advised that any protests have been entered by riparian landowners in the Arkansas valley below Garden City, that the taking of the water from the underflow would cause a lowering of its level. We would remind counsel that the contracts for this pumping plant are not yet completed, and its construction has not yet been commenced, and even Mr. Slichter himself did not know to what extent this pumping plant would affect the water-level of the underflow. It may take years before any effect upon the level of the underflow become manifest, and it seems to us that present protests would be somewhat premature.

On page 177 counsel for the intervenor quote from our former brief a paragraph found on page 211, and then say that according to their interpretation the citizens of the upper state have the legal right by prior appropriation to the waters of the stream for irrigating their lands, while the citizens of the lower state have the legal right to prevent such use. The only difficulty found here exists in the minds of counsel. A subsequent appropriator has the legal right to irrigate his lands, but such legal right may be subsequent to the right of a prior appropriator.

On page 179 counsel for the intervenor say that it is not true that the doctrine of prior appropriation could be enforced in the upper state, and the doctrine of riparian rights could be enforced by citizens of the lower state. In regard

to this we reply, that it is just as easy and just as practicable to enforce prior appropriation in one state and riparian rights in another, according to their real priority, as it is to enforce a prior and subsequent right under the doctrine of prior appropriation in a single state. These rights may not be enforced perhaps exactly at the same time, but when the prior right has been satisfied then the subsequent right may also be enforced.

In the last section of their brief, beginning on page 198, counsel for the intervenor say that the crucial and important question in this case is as to what is the law in regard to the waters of a non-navigable interstate stream which rises in and flows through a state where the doctrine of riparian rights has been abrogated, and flows thence into and through a state where such doctrine prevails. They further say that "upon its solution depends the continuation of the present prosperity and future growth and development of the arid region of the United States." We most respectfully ask why the prosperity and future growth and development of the arid region of the United States should be of such concern to counsel that they entirely overlook or would be willing to destroy the prosperity and future growth and development of the humid region of the United States. It seems to be the whole aim of counsel for the intervenor to develop the arid regions at the expense of the prior settlements in the humid regions. It seems to be the aim of counsel for the intervenor to turn the reclamation service into a system of land-grabbing and wholesale devastation of prior rights and prior development. Against this policy we protest, and call attention to the fact that the witnesses introduced by the intervenor themselves protested against any such intention. The leading witnesses for the intervenor testified again and again that the reclamation of the arid lands was not to be effected at the expense of the prior civilization and property rights in the lower states. They testified that this reclamation of the arid lands could be accomplished without any destruction of

prior civilization and prior property rights in the lower states.

Section 8 of the reclamation act of June 17, 1902, is as follows:

"That nothing in this act shall be construed as affecting or intended to affect or to in any way interfere with the laws of any state or territory relating to the control, appropriation, use or distribution of water used in irrigation, or any vested right acquired thereunder, and the secretary of the interior, in carrying out the provisions of this act, shall proceed in conformity with such laws, and nothing herein shall in any way affect any right of any state or of the federal government, or of any landowner, appropriator, or user of water in, to or from any interstate stream or the waters thereof; provided, that the right to the use of water acquired under the provisions of this act shall be appurtenant to the land irrigated, and beneficial use shall be the basis, the measure and the limit of the right."

Upon this point Mr. Newell says:

"Assuming that it were possible to utilize all of the waters of the Missouri and Yellowstone rivers in Montana, and assuming that that should be done, it would obviously destroy the irrigation possibilities in North Dakota. Assuming that that were true in each of the other upper states, it would of necessity destroy the irrigation possibilities in the lower states. We, in the administration of the reclamation service, have tried to avoid the difficulties and are vitally interested in securing the establishment of a principle on which we can take up these questions in the future. If it should be established that the upper state should have the right to take all of the water of an interstate stream that falls within her borders, it would necessitate a readjustment of many of these projects, and in some cases an abandonment of lands which, as to low altitude, are perhaps a little better situated climatically, and it would practically contract the application of the reclamation act to those upper states so far as the physical possibilities extend." (1274.)

Upon this point Mr. Mead says:

"In the arid region the water is one of the most valuable forms of property in itself, and hence ought to be considered simply as a form of property in itself, irrespective of its relation to any other kind of property, and handled in that way; and, as I stated yesterday, I believe that the doctrine of appropriation coupled with the doctrine of protecting prior rights to beneficial use is the doctrine which should prevail, and that it should displace the doctrine of riparian rights. Now, wherever the conditions of aridity require the use of streams for

irrigation, I believe that the doctrine of priority of appropriation should prevail. I think it should prevail in every state, and that the existence of a state line has nothing whatever to do with the meritorious character of that doctrine, and that the principle should be so applied as to protect prior rights—the prior appropriators in the lower state against the encroachments of later appropriators in the upper state. Now, when we come to consider that question, it has practical difficulties, because the system of one state cannot be extended across another state. You have separate officials and separate laws in the different states. There are two solutions of the difficulties arising out of that situation: One is to turn the entire control of the water-supply of the streams over to the federal authorities and to ignore state laws; the other is to seek some solution of this matter which, while retaining intact the local control in particular localities, and the maintenance of the laws and customs of each of the states so far as they apply to their own citizens, will at the same time protect the rights of the users in the lower states." (1404.)

Senator Warren, who was chairman of the committee of seventeen which framed the reclamation act, says:

"As to the effect upon the reclamation act and the reclaiming of arid lands under it if the upper state had the right to own and control all of the water that fell within its borders, and if it did actually take and apply to irrigation within its borders all the water that fell within that state, I will answer, first, that the act of Congress does not provide that, because the act is one recognizing priority of rights and the expectation is that the state below may go into the state above and take out the water if it is a matter of prior entry and application." (1291.)

Mr. Mondell, the chairman of the committee on irrigation in the present lower house of Congress, says:

"In respect to the preparation of the reclamation act, and as to the intention in framing and passing that act that one state should have the right by virtue of her state sovereignty and her constitution to take and appropriate for irrigation purposes all of the waters that fall within her borders, regardless of the prior conditions of the people and of the settlements below the borders of that state on streams flowing from the upper state into the lower state, I will say as a member of the committee that framed the law that it was not my thought or intent that we should by the passage of that legislation encourage that kind of practice. If any state were to insist upon and uphold the diversion of waters entirely regardles of prior apropriators in another state below, and that were carried out, it might entirely deprive settlers in the

lower state down the stream, under a government project, of their water, or even under a private project, if the conditions were carried out in the upper state. If such a claim as that should be made and carried out by the upper state without regard to prior appropriators in the adjacent state farther down the stream, I should say it would have the effect of contracting the reclamation service to the upper state, and it would have that effect very largely in the states farthest down on an interstate stream." (1183.)

With these quotations from the testimony before us, and from others that might be added, we feel safe in asserting that, if some portions of the present brief of counsel for the intervenor had been before this committee of seventeen, no reclamation act would have been framed by the committee or enacted into a law by Congress. We are constrained further to observe, that if some portions of the intervenor's brief are to be taken seriously, and to become the rule or law of the land, Congress would at its first session repeal or modify the reclamation act. The long residence in an arid state of the counsel for the intervenor who prepared this brief must have limited his view and blinded his vision so far as the rights of other states are concerned. In confining their attention wholly to the arid states, the counsel for intervenor have overlooked the interests of the lower states, and when they say that "Water irrigates; let it irrigate," we reply that this is a wholesome doctrine only when not carried to the extent suggested by counsel, and when applied with due regard to the rights of parties below.

On page 204 of their brief counsel for the intervenor say that "The application to interstate streams situated as is the Arkansas river of the doctrine of appropriation, etc., will not destroy the stream in the lower state." To this statement we reply, that it has done it; that the Arkansas river through the state of Kansas has been destroyed and its waters wholly diverted in the state of Colorado.

On page 205 counsel for the intervenor say that the evidence of the defendant Colorado tends to show that "It is neither using nor threatening to use for irrigation purposes

any of the waters of said stream." In regard to this it is the uncontradicted evidence of the state officers of Colorado that they control the waters of the Arkansas river within that state, and that they do take the whole of them for the purposes of irrigation. It is not the individuals and the corporations who primarily take these waters, but the waters of this river are given to the individuals and corporations by the officers of the state of Colorado, acting within their statutory authority.

On page 205 counsel for the intervenor further say, that the witnesses for the defendants and for the intervenor testified "that if irrigation in the upper state were confined to lands within the watershed of the stream it would be impossible wholly to exhaust the flow thereof in the lower state." We submit that this statement is entirely too strong, and is incorrect. The evidence introduced and the report of the International Boundary Commission heretofore quoted by us show that irrigation in the state of Colorado has destroyed the natural flow of the Rio Grande, the Arkansas, the South Platte, and seriously interfered with the North Platte. It is simply absurd to say that, if all of the water of a stream is appropriated in the upper state, the natural flow of the stream is not affected in the lower state.

On page 206 counsel say that "The erection of reservoirs to impound the flood-waters, which is necessary in order to carry out the policy of the government as indicated in the so-called "reclamation act," will have the effect of maintaining and equalizing the flow of the river in Kansas." With this statement of counsel we are in entire accord. We have heretofore urged, and now urge again, that the flood-waters of the Arkansas river should be impounded for irrigation purposes and not be allowed to run to waste, but this does not mean that irrigators in the upper state should be allowed to take the entire normal flow of the river, to the perpetual injury of the citizens of the lower state.

At the conclusion of their argument counsel for the inter-

venor say that "The reclamation and cultivation of the arid lands of the United States is indispensable to the growth and future prosperity of the United States." In addition to this statement we reply that the United States was the grantor of all the lands in the Arkansas valley prior to any material diversion of waters for irrigation purposes in the state of Colorado, and that the government is as much in duty bound to protect its grantees in the rights it conveyed to them, as it is to go into arid regions and create new rights. It is as important for the United States government to defend and protect the lower state as it is for it to reclaim the arid lands in the upper states. The brief of counsel for the intervenor seems to be a special plea for one section, and that section alone. We are insisting that the rights of one state and its citizens in the humid region are as important as the rights of a state and its citizens which lies at the crest of a mountain range. We also insist that the development of one section shall not be at the expense of another, and that the reclamation service was never created for such purpose, and that the reclamation act was not passed to that end. Counsel in their zeal for one region have entirely overlooked the interests of the people in another region, and upon this point and for this reason the brief of counsel for the intervenor presents a one-sided and sectional view, which, in all courtesy, we think the general government should not assume, and this court should not approve.

It is apparent from the evidence of Mr. Newell and from the maps prepared by the Geological Survey that many of the projects now in process of construction are purely interstate. The Pathfinder project lies in Wyoming and Nebraska. The Buford-Trenton project lies in Montana and North Dakota. The Payette-Boise project lies in Idaho and Oregon. The Klamath project lies in Oregon and California. The Truckee-Carson project lies in Nevada and Colifarnia. The Grand River project lies in Colorado and Utah, while the Yuma project lies in Nevada, Arizona and California, and

extends down into Mexico. In all these projects the waters of the upper state must be used in the lower state or the projects cannot be completed and the money spent will be lost. We entirely agree with counsel for the intervenor that the upper state has no inherent or constitutional right to the control of the waters of an interstate stream regardless of the rights of the state below, and we entirely agree with them that such a doctrine would seriously and permanently interfere with the projects now under construction by the reclamation service; on the contrary, we insist that the waters of an interstate stream may be used for irrigation at any point, always, however, respecting prior rights along that stream, wherever situated, and we respectfully urge that, having first protected these prior rights, the flood-waters of these streams may be and should be impounded and used for irrigation purposes at any point where they can be most conveniently and successfully applied.

SECTION 16. The Decree.

On pages 183-185 of our former brief we printed a "Summary of Facts Proved," and on pages 186-188 the "Propositions of Law Involved."

We now submit that these facts have all been proved and those propositions of law have all been established. Under those facts and the law we think we are entitled to a decree in accordance with the following conclusions:

FIRST. The common law of riparian rights is in force in the state of Kansas, and applies to such lands as are directly affected by the presence or flow of the Arkansas river, and which extend back to the uplands on either side, and this law includes the uses for irrigation.

SECOND. For irrigation purposes the law of prior appropriation, and not the law of riparian rights, is in force in Colorado; but such an appropriation must be subject to the riparian rights in Kansas, and the lands along the Arkansas river in Colorado in their natural state were not affected by the presence or flow of the river.

THIRD. Kansas is entitled to the normal flow of the Arkansas river and its tributaries at all times of the year, subject to any existing riparian rights in Colorado.

FOURTH. Colorado is not entitled to the whole flow of the river and its tributaries within that state, under its constitution and the law of prior appropriation.

FIFTH. Kansas is entitled first to a sufficient amount of the waters of the Arkansas river and its tributaries to sustain and support such vested rights of whatever nature as were established prior to rights created by subsequent appropriations for irrigation purposes in Colorado.

SIXTH. Colorado is entitled to such waters of the Arkansas river and its tributaries as have been appropriated for irrigation purposes within its borders in the order of appropriation, after first deducting such amounts as will sustain and support the prior vested rights in Kansas, of whatever nature.

SEVENTH. For the purpose of making operative the decree of injunction herein, and preserving the rights of all parties as found and declared, this court should, if necessary, appoint a suitable person to enforce the rights as found under this decree, to execute the provisions thereof, and to distribute the flow of the Arkansas river according to the rights as found and declared. Jurisdiction of this cause should be retained by this court herein as long as may be necessary to give the decree force and preserve the rights herein established.

Respectfully submitted.

C. C. COLEMAN, *Attorney-general of Kansas.*

S. S. ASHBAUGH,
N. H. LOOMIS,
F. DUMONT SMITH,
Solicitors for Complainant.

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IN THE SUPREME COURT
OF THE UNITED STATES.

THE STATE OF KANSAS, *Complainant,*
vs.
THE STATE OF COLORADO *et al.,*
Defendants.
THE UNITED STATES, *Intervenor.*

3 Orig

PROTEST OF COMPLAINANT AGAINST THE FILING OF THE "REDUCED ABSTRACT" PREPARED AND SUBMITTED BY THE INTERVENOR.

C. C. COLEMAN,
Attorney-general of Kansas.

S. S. ASHBAUGH,
N. H. LOOMIS,
F. DUMONT SMITH,
Solicitors for Complainant.

IN THE SUPREME COURT
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THE STATE OF KANSAS, *Complainant*,
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Defendants.
THE UNITED STATES, *Intervenor*.

PROTEST OF COMPLAINANT AGAINST THE FILING OF THE "REDUCED ABSTRACT" PREPARED AND SUBMITTED BY THE INTERVENOR.

THE above-named complainant respectfully protests to the court against the filing in this cause as a representation of the evidence therein of the so-called "reduced abstract" prepared and presented by the intervenor, and as reasons for said protest and of the refusal of the said complainant to recognize the said "reduced abstract," the complainant submits:

First. All the briefs are based on, refer to and quote from the official abstract prepared by all the parties under the order of the court. The "reduced abstract" would confuse the court and lend no assistance.

Second. The court in reading the briefs must refer to the official abstract, and to use the "reduced abstract" would increase the labor rather than diminish the same.

Third. The "reduced abstract" does not present the complainant's case as it appears in the evidence at all acceptably to the attorneys for the state of Kansas.

Fourth. The "reduced abstract" appears to be a brief or argument of counsel who prepared the same, and appears to be their view of the facts, and we decline to accept their view of the facts the complainant relies on in this case.

Fifth. On page 56 of the "reduced abstract" it says that on cross-examination of Mr. D. E. Breese the witness says: "That the river has been decreasing since 1891; that he does n't know what has caused this, but attributes it to the taking of water out of the river"; and we submit that this is not a fair statement of the evidence found on page 296 of the official abstract.

Sixth. The complainant's evidence on important facts is stated through twelve pages, from page 51 to page 63 of the "reduced abstract," and the evidence of defendants' witnesses on the same facts is stated through forty-nine pages, from page 63 to page 112.

Seventh. On page 110 of the "reduced abstract" it says of the cross-examination of Mr. Monahan, that the witness "never saw the river during the months of May or June when there was any running water in it," while on page 784 of the official abstract this witness had said: "In going in the month of June, that is, going down the river, the river was fordable; it was low. There was water at all points in it where I saw it." It is the "reduced abstract" which is at fault, and not the evidence.

Eighth. On page 162 of the "reduced abstract" it states that Mr. Sarmor "never had a failure of crops for want of moisture," which contradicts his testimony, found on page 1463 of the official abstract, and it is the "reduced abstract" which is at fault and not the witness.

Ninth. On page 163 of the "reduced abstract" it states of Mr. Hill that he "don't think that the level of the underground water could have gone down about three feet without my knowing something about it," and yet two sentences before this witness says: "Yes, there could have been a rise or fall

of two or three feet in that water-level without my noticing it in my wells, because we don't use the surface-water."

Tenth. On page 162 the "reduced abstract" says, in commenting upon the evidence of other witnesses, that "their testimony in substance and effect is the same as that of Mr. Crane, viz., that the flow of the river in recent years compares favorably with that of former years"; but we fail to find where Mr. Crane made such a statement, and Mr. Evans, one of the witnesses referred to, on page 1506 says: "Well, taking the period from 1880 up to the present time, the flow is better in the last two years." And again, on page 1508 of the official abstract Mr. Evans says: "Yes, there were a number of very heavy rains in those days [1904] that kept the river flowing a good share of the year 1904. Yes, sir; and I said that condition in 1904 was about the condition of the river as I knew it down to about 1880. Yes, sir; and I said that the river fell off after that and became very much drier than in the earlier years." These comments of the "reduced abstract" are unjust and incorrect.

Eleventh. On page 171 of the "reduced abstract" it is stated that Mr. Riney says that at Dodge City, "we are out of what is known as the corn belt"; and yet this witness says, on page 1909 of the official abstract, in the next sentence, "well, no, we are not too high up and have too little rain for the purpose of raising corn. I believe if we have the underflow there we can get that sub-irrigation from the river that will grow corn all right."

Twelfth. On page 171 of the "reduced abstract," in commenting upon the complainant's witnesses introduced at Larned, it is stated: "None of the above witnesses, however, testified that the lands in the valley of the river had decreased in productiveness by reason of the decrease of the volume of the water in the river." Mr. Dickinson is one of these witnesses referred to, and yet, on page 1990 of the official abstract, he says: "As to growing crops—hay crops—on my land, which is bottom land, in the earlier years it ran from

three-quarters of a ton to a ton and a half on the acre, on an average. After the dry years came, from 1886 to 1887 up, why, if we got one-quarter or one-half of a ton to the acre it was all we got." On page 2021 Mr. Worrell says: "If we could get the natural flow of the Arkansas river during the dry season of the year it would certainly be beneficial to the bottom lands, because it would be a sub-irrigation to the bottom lands here and we could raise crops under it." Again, on page 2017, Mr. Heller says: "In the first ten years, when we had water in the river all the time, we raised good crops right there on my place, and after the river began to go dry we began to fail in crops right along."

Thirteenth. On page 172 of the "reduced abstract" it is stated that "none of the witnesses examined at Great Bend, in rebuttal, made any statement tending to show that the decrease in the volume of the water in the river had any appreciable effect on the productiveness of the lands in the river bottom." Mr. Unruh, one of these witnesses referred to, testified, on page 2051: "As to what kind of corn crops we raised in the early days, oh, we raised a good crop of corn. As to what kind of crops we raised during a dry season, well, we did n't raise that much in dry seasons. Nobody could raise corn in a dry season without the underflood. And as to raising it with the underflow during a dry season when there was no rainfall, well the underflow helped a good deal. During a season when there was no rain or but little rain it did assist in maturing our crops, yes, sir. As to how long that condition existed before the underflow went down, I will say, up to the year 1890, and since that time the underflood has gone down."

Fourteenth. On page 195 of the "reduced abstract it is stated that "complainant failed to introduce any testimony with respect to any specific injury to lands owned by it near Hutchinson, Kan."; yet in their testimony Mr. Caldwell, of Hutchinson, Mr. Lowrence, of Wichita, Mr. J. W. Shive, of Burrton, and Mr. Edwards, of Kinsley, all testified that the

conditions which they described extended to all the lands in the valley known as bottom lands.

Fifteenth. Upon the question of seepage the "reduced abstract" is especially unsatisfactory to the complainant. The most important testimony given by any witness was that of Mr. Cressy, of Rocky Ford, the local water commissioner and witness for Colorado; and yet not a word of this testimony, found on pages 923 and 924 of the official abstract and quoted on page 64 of our reply brief, is found in the "reduced abstract."

Sixteenth. The comment found on page 48 of the "reduced abstract" concerning what the witnesses testified to is equally objectionable.

Seventeenth. Commencing on page 26 of the reduced abstract, testimony is quoted in regard to the question as to whether Colorado is actually threatening wholly to exhaust the flow of the Arkansas river. Among the witnesses whose testimony is given is that of Mr. E. R. Chew, irrigation engineer of the state of Colorado. The testimony of Mr. Chew is given on pages 26 to 29 of the "reduced abstract." The following portions of the evidence of Mr. Chew which the state of Kansas deems most essential for a proper consideration of its side of the case have been entirely omitted from the "reduced abstract":

Page 503, official abstract:

"Sometimes the season will not permit them (the Colorado irrigators) to have any water at all, hardly, only a very limited amount; sometimes the season will give them their full decrees. . . . During the last few years these ditches referred to (Colorado ditches) have not been getting as much water as they wanted. There is great difficulty in distributing the water because the water is not in the river to give them, and when there is no water in the river everybody wants what is there and we can't let them have it. Then I close the gates down and stop them from taking it and give it to those it is decreed to, or to the owners of the priorities. . . . I don't think there has been more than two really good years in the last eight years when we had plenty of water."

Page 515, official abstract:

"Most of the crops we raise here are spring crops, and they begin to mature in June and from that until September, and nearly all are matured by September, and most of the water that is used for irrigation purposes while these crops are growing is used from March to September. The hottest season is in July and August. I presume that it has an effect upon the quantity of water used in the irrigation of crops.

"I have known the temperature here to get I think 100 deg. in the shade. It is hotter down at the Kansas state line than it is at Pueblo.

"I think there is some evaporation of water in the river, but not very much. I don't think there is very much in the canals. There is a certain amount of evaporation when the water has been spread over the ground for the purpose of supplying moisture to the growing crops. I am not positive how many acres of land are irrigated from the waters of the Arkansas river and its tributaries in the state of Colorado, but as nearly as I can recall there is something like 400,000 acres. It is a matter of record in the state engineer's office. I presume that about seventy-five per cent. of that is irrigated during the hot months of the summer. The waters of the Arkansas river during these hot months are distributed over this large area of land for the purpose of getting moisture to the growing crops. . . . We see that the water is properly distributed, for the purpose of settling all disputes. The bulk of the disputes get to me, and these come thickest in May, June, July, and August. The want of water causes them to come to me thickest at that time. These are the months when there is more scarcity of water and when the water is used most generally along the river, and when they get into trouble mostly about the water. During these months I am not able to supply them all with the water they need. . . . In order to give them all I could I took all the water from the river that I could possibly get, and I did n't allow a bit of it to get away if I could help it. We had special orders not to allow any to get down the channel into Kansas. These special orders originated with me."

Page 517, official abstract:

"In speaking of the water being captured again after returning to the river as seepage, I meant to say if the appropriation nearest to the water was entitled to it, it would get it. The water that would gather in the river below the dam I don't think some of it would ever get to any dam whatever below; it would be taken into a small ditch. It would go down until it struck some other ditch and it would then be captured by that ditch, if it was entitled to it. If a dam should

take all the visible water above it and put it into a ditch some of it would get back again and some of it would go under the dam, but the next dam or ditch would catch it if it appeared, if there was any of it in sight. Then, if any happened to go by again from that ditch or dam and went down the river a ways, another dam or ditch would capture it again if it appeared, if there was any of it in sight; and that would be kept up from one end of the river to the other, until the Kansas line was reached, and then Kansas would get it. There is some left and Kansas gets it."

These are but a few of the instances in which said complainant believes the "reduced abstract" is not a fair representation of the evidence submitted in behalf of the complainant.

Wherefore, as aforesaid, the said complainant earnestly and respectfully protests and objects to the filing of said abstract as an abstract of the evidence for the use of the court, and protests and objects against its use in any other way, form or manner than as a part of the argument of counsel for the intervenor. Respectfully submitted.

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Attorney-general.

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Solicitors for Complainant.